BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 16 1949

IN PRAISE OF IDLENESS*

BY

Sir HENEAGE OGILVIE, K.B.E., M.Ch., F.R.C.S.

Surgeon to Guy's Hospital

The distinction of delivering the Beyer Memorial Lecture in Johannesburg is the culminating-point of a train of events that started when I went from Oxford to Guy's in 1910. Here I found myself among South African students, and later I numbered many South Africans among my colleagues, my pupils, and my friends. It was therefore only natural thirty years later, when the world decided to evict Mussolini from his Ethiopian empire and entrusted the task of throwing him out to a small force whose medical and specialist services were largely South African, that I should be appointed Consulting Surgeon. In that East Africa Force, whose advance from the Juba to Addis Ababa has never been approached in brilliance by any other campaign before or since in military history, I met for the first time many South Africans, soldiers and doctors, who are my firm friends to-day. After the fall of Addis Ababa I eagerly seized the occasion to visit the wounded in the base hospitals and specialist centres of the Union.

South Africans come to Guy's to learn medicine and to play Rugby football. They are not merely excellent players, they are also able to tell each other in Afrikaans where the ball is coming, and whether they intend to pass or run on. This ruse failed, however, when we met our great rivals St. Bartholomew's Hospital in 1910, for playing back in the Bart's fifteen was a young South African, Christian Beyers, the man we are honouring to-day.

The students of other hospitals sometimes accuse those of St. Bartholomew's of giving themselves airs. They say, "You can always tell a Bart's man, but you cannot tell him much." Yet they all respect the oldest hospital in England, the medical school that trained Pott and Abernethy, Paget, Butlin, and Bowlby. No one could accuse young Beyers of superiority; he was the most sincere and the most modest of men. No one could call him a bookworm, yet he absorbed into his being the great traditions of his hospital. In Johannesburg he became a pillar of South African surgery. A nation asks of its surgeons that they shall be wise, honest, and skilful; Beyers was all of these, and he was also human and kind. When he died before his prime he left a company of colleagues who loved him as a man and a multitude of patients who owed their restored health to his skill as a surgeon.

Beyers has left behind him a great record and a great example. South African surgery stands very high in the world to-day, and you have in this city of Johannesburg men whose reputation is international, men who spend their days in constructive work and their leisure in writing. A sermon in praise of idleness by one who comes to you from the more leisured atmosphere of an older country may therefore be opportune.

*The Beyer Memorial Lecture delivered at Johannesburg on Nov. 24, 1948.

Proper Use of the Mind

We pride ourselves that we live in the age of science. The scientific method, based upon observation and experiment, was the intellectual habit of the Greeks. It vanished in the Dark Ages, swept away with beauty and culture by the barbarian tidal wave that swamped Europe. It reappeared with the Renaissance and has progressed ever since.

The scientific method has led to the unparalleled advance of medicine since the time of Harvey; it has, however, the limitation that it is worked by the human mind, a machine subject as all machines are to individual tricks and idiosyncrasies. Yet whereas the mind can make due allowance for faults when they are found in machines other than itself, towards its own faults it is apt to be blind, particularly when it is driven, as no machine should be driven, without rest periods for inspection, adjustments, and renewals.

Man insists on the alternation between work and idleness in the creatures of his own hands and brain. He plans to lay aside his cars at stated intervals to adjust the effects and to replace the ravages of wear. He applies the same principles to his fellow men. The Mosaic Law enjoined one day's rest in seven. Modern conditions, however, tend to interfere with this alternation between work and rest, particularly between mental work and mental rest; for, while the body cannot be driven beyond a certain point without rebelling and ceasing to function, the mind works with no measurable metabolism or consumption of energy, and can go on working without rest, further work often providing the stimulus to greater effort, till the bearings of the machine melt.

What we have come to call civilization has upset the proper use of the mind. In olden days men were individuals. Each man learned from his parents, his fellows, and his elders, but his thoughts were his own thoughts, worked out by him from his gleanings, from his observations of the sky, the sea, the trees, and the animals, into a personal store of knowledge and opinion. Each man worked for a master, but he received his task in the rough to work out according to his own ideas. The journeyman builder was given, not a blue-print to follow slavishly, but a piece of stone to shape into a pillar that should fit one corner of the church that was rising in the meadow, and if he was instructed to decorate the capital he was free to work out a design that included his favourite dog or a caricature of his foreman. Throughout the day his mind was engaged on varied and interesting tasks, and at the day's end it needed and valued rest.

Nowadays men are not asked or encouraged—indeed, are seldom allowed—to think. Their growing minds are

moulded at school on Government-sponsored primers, and thereafter they receive their opinions from books or newspapers. Their work is no longer personal or intelligent, but some small portion of a whole of which they have no conception, repeated without the use of any mental process several times a minute for fifty-five minutes in the hour, eight hours in the day, five days in the week, and eleven months in the year.

Such a mind is permanently idle, and to it idleness does not mean rest. It has not been weaving patterns from rough materials, but has remained passive while ready-made and standardized patterns, mass-produced on the cheap to fit cortices of every grade and every race, were scribbled over it. When not so used it has no means of self-employment, no stores to lay down in the basement; and the primitive instincts of the herd—love, fear, hate, and greed—stir dimly in those caves of instinct and produce mass sentiments masquerading as thought, clichés and catchwords that form the conversation and the wit of the moron.

The active mind, on the other hand, may be working all the time and come to no harm if the work is congenial, interesting, and within its trained capacity. The artist can paint for hours without being aware of the clock; the surgeon can perform a four-hour operation of the greatest intricacy, at every stage of which he has to make decisions of prime importance, yet he feels no fatigue. But let the artist trudge round a picture gallery, or the surgeon try to watch a colleague for four hours, and both of them will be calling for a Guinness. The mind can work thus continually without tiring, and do so day after day, but it is not doing its best work. It is making decisions without storing them, collecting pictures without hanging them in the galleries, laying up a hoard of valuables which become treasures only when they are sorted out in relation to each other and properly displayed.

Constant use of the mind does not lead to exhaustion any more than constant idleness leads to refreshment. What exhausts is effort rather than use, the performance of tasks that are distasteful or that are beyond easy fulfilment, the fear of failure because the training is inadequate, the intelligence insufficient, the experience too small and too recent. Even so, an internal-combustion engine suffers little harm when it is run for long hours within its capacity or for short bursts at full speed, but when it is constantly set to do the work of a larger engine by operating at full load for hours on end it very soon gives out.

The Cerebral Cortex—the Last Refinement

But a simile that likens the human mind to a machine is over-simplified. The part of the brain that is machine-like is that part whose pattern was designed in the dim evolutionary past, the part that functions automatically while life lasts, whether the owner is directing those functions or not, whether he is asleep, drugged, or engaged in other business. We know that cats or dogs deprived of their cerebral cortex are still cats and dogs with many of their qualities intact. The dog has lost his affection and the cat his aloof cynicism, but both can run about the room in a manner that differs little from normal. Both can show fear and rage. The age-old machinery of the ductless glands, acting by a mechanism of chemical conduction that is but a refined version of the way in which the amoeba finds its food, the autonomic nervous system that recalls the central nervous system of the earthworm, the central ganglia standing at the head of the spinal cord like the cerebral ganglion of cyclostomes, will do all or nearly all that we need to do without conscious attention from us. They will breathe for us, keep our hearts going at the required speed, adjust our circulation, look after our digestion; they will, with barely conscious guidance, conduct the intricate balancing movements required to ride a bicycle or the complicated calculations that tell us which foot will reach a bar fifty feet ahead when we are running for a long jump. The cerebral cortex, that gives a consciousness to the sorrows, hopes, and fears arising at these lower levels, is the last refinement, the part in whose development we pride ourselves as possessing something that distinguishes us from the lower orders of creation, the part whose highest advancement is the distinguishing mark of the man who stands above his fellows.

The old machine supplies the power, the cerebral cortex determines the direction and length of the journey and its speed, but the two functions of the mind—control and power—vested in different parts of the same machine, can never be entirely distinct as are a driver and his automobile. The driver may step out and go indoors, and while he is away the machine is at rest. The cerebral cortex relaxes its control during sleep, but the subcortical brain is ticking over in the garage, and at any time it may spring to life and race away. And when some part of the operating mechanism takes charge—fear, hunger, or, most dominant of all, sex—the machine is off at top speed and the owner must jump into the seat, seize the wheel, and do his best: he is in for a ride over which his control is not much more than illusory, a ride that may thrill him or lead him to disaster.

What We Lack To-day

When we sigh for the good old days we are immediately reproved by the social reformer, the politician, the statistician, and the leader writer. We are told that there were no good old days; that these distant periods are gilded for us by the mists of time and by the tendency of onlookers to mistake picturesqueness for happiness; that the fortunate few lived in luxury while the workers were poorly clothed and poorly housed, having none of the pleasures that the working-class enjoy to-day, uncomplaining because they knew no better. On the other hand we make a great mistake if we think that happiness consists in having a forty-hour week, a smart car, a television set, and a chromium-plated bathroom. Happiness consists in a job that provides a succession of varied and interesting tasks that demand skill and call for individual enterprise, that is useful to the community in which we live, that offers security if we do it conscientiously and advancement if we do it well, and, if not a belief in a future life, at any rate a confident belief in the future that this life holds for us. All these things the craftsmen and peasants of the Middle Ages had. All or nearly all of them we lack to-day.

The world is no longer full of opportunity. The adolescent must study the openings in a number of trades and finally choose one, knowing that he is on a path that he must follow for the rest of his days. He must work hard and wait long for advancement, which is the reward of uncomplaining waiting rather than of merit. And he is prevented by class and family pride, by the wish to start where his father left off, from making a home and starting a family till long after the age when such occupations are instinctive and physiologically desirable. Later we see him still more unhappy, frustrated because the chance for which he has been working has still not materialized, unable even to confess his fears or share his disappointment because both he and his wife have lived their own lives and put their own interests first for so long before they married that they have been unable to establish that mutual confidence and self-sacrificing comradeship that is the basis of happy marriage. Such men are, in the words of the old song, "all dressed up and no place to go." They have been

training so long after achievement that strain has become second nature. They are so constantly keyed up to fight the world that is trying to tread them down that they are in a state of continual and futile preparedness. Their basal ganglia are tuned for combat in the day and rehearsing combat during sleep. Their autonomic system is driving their digestive mechanism beyond the needs of appetite and getting their metabolism at a level they do not really require.

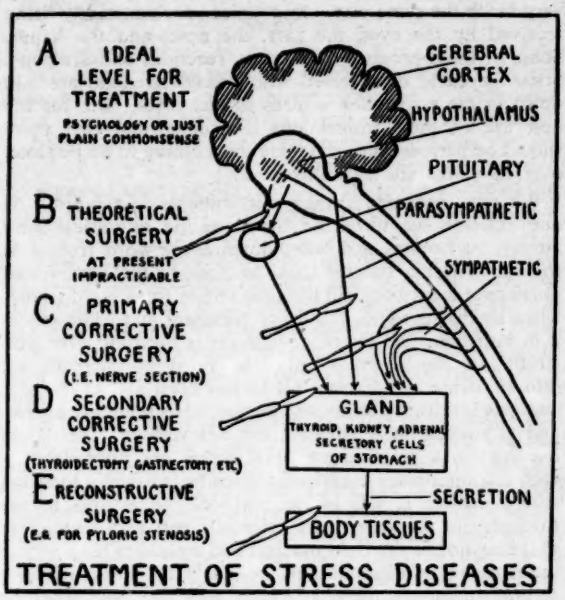
The mechanisms that are being called into play are all normal ones; the only abnormality is that they are being called on constantly. It is unlikely that any organ or system in the body ever works anywhere near to capacity. The number of nephrons in the renal system is reckoned to be three times that required for normal excretion; it is probable that they work in turn and rest in turn. The brain, of all organs in the body, shows perhaps the greatest surplus of functional matter over requirements of function. Body and mind seem to have been designed with a tremendous reserve of essential machinery, so that in their normal working labour and rest may alternate. In modern life they are forced to work abnormally.

Stress Diseases

These are the conditions under which a great proportion of the inhabitants of the older and more civilized communities live, and these are the conditions that are causing them to break down and are producing a group of diseases that we may call the stress diseases. In the less stoutly built it is the mind itself that gives way. In the more stable the mind remains coherent and calm and the mechanism working beneath it cracks under the strain. The primitive tribal emotions that reside in the basal ganglia take charge. The autonomic and endocrine arsenals pour out their munitions to excess.

Three diseases stand out as striking and universally acknowledged examples of stress casualties: thyrotoxicosis, duodenal ulcer, and non-renal hypertension. These diseases, as becomes a group that have a similar origin, have certain features in common. They were relatively rare till the beginning of the present century, but since that date their incidence has increased progressively. They are found in civilized countries, in the urban and industrial areas of those countries, and among the more intelligent, ambitious, and hard-working members of the communities. They are seldom encountered in the placid and the lazy, and are practically unknown among native races living under natural conditions. They are thus diathetic or psychosomatic diseases, disturbances of the normal relation of mind and body by overpowering circumstances, and for that reason calling for some general remedy. Yet at present all, except in their earliest stages, appear to be best treated by surgery of a somewhat crude nature. The rational aim of surgery would be to intercept one of the torch-bearers between the hypothalamus and the final recipient in the body tissues. This, unfortunately, is rarely possible, and we must endeavour to correct the defect in the final recipient tissue itself (see Fig.). Our treatment is thus local and destructive. It removes some part only of an activity that is essentially widespread, and tackles a manifestation rather than a cause of the disease; but nevertheless it leads to an improvement that is more satisfactory and more lasting than that produced, in the present state of our knowledge, by any other means.

Of all people we surgeons are most prone to these diseases. I can hardly claim that we are more intelligent, ambitious, and hard-working than any other section of the community, but we certainly shoulder as great a responsibility and must undergo as great an anxiety as any, and so long and so steep is the ladder to advancement, so many



TREATMENT OF STRESS DISEASES

the hands that clutch at its rungs, that we suffer frustration as an occupational risk. Acute hyperthyroidism is distressingly common, and apparently on the increase, among young medical men, usually those holding junior staff appointments and trying to stretch a slowly growing income to cover the needs of a rapidly growing family. Duodenal ulcer is the disease of the surgical registrar and junior surgeon, and an unannounced visit to the surgeons' room at any hospital will usually surprise one of the staff swallowing his glass of citrated milk and his alkaline tablet between operations. Hypertension affects surgeons in their fifties, and makes them one of the worst occupational risks from the point of view of insurance companies.

Rest Periods

To what extent are these risks avoidable? The young man who has carried all before him in his medical school, who has good brains, clever hands, and a stout heart, would be a traitor to himself if he did not plunge unafraid into the battle, prepared to give and to take hard knocks till he has won through. But when he has so won, when the clash of steel sounds fainter behind him and he stands bloody and unbowed with a few comrades equally tough on the upper slopes, he is apt to keep the same combative outlook from mere force of habit, to go on fighting for fighting's sake and working because he has never done anything else. It is this prolonged and no longer needed exertion that is harmful. It is unfair to all those cultural sides of his nature that have had to be laid aside for a time. It is unfair to his wife and his family. It is bad for his thyroid, his adrenals, and his cardiovascular system. Above all it is bad for his surgery.

It is to an audience of medical men, above all to an audience of surgeons, that a sermon in praise of idleness is necessary. We have seen that idleness is a part of function. The heart gives one gigantic heave that sends a dose of blood racing along the aorta; but systole lasts only one-third of a second, and for twice as long the heart muscle takes a rest. A meal is followed by a rest from eating, during which the stomach and proximal intestine break the food down to its elemental constituents. The gastric, pancreatic, and intestinal juices cease while the lower ileum and proximal colon absorb. The mental machinery works

very much the same way. Impressions are constantly being received by the eyes, the ears, the nose, and the hands. Some of these produce momentary reactions and are gone. Some, repeated or received with special strength, are laid down in the association centres as memories. But for the best use of these impressions it is important that there should be periods when the mind has nothing to do but look over its stores and sort them out.

We can recognize among our students two types. At one extreme we have the overpowering enthusiast who attends all lectures and takes down every word from first to last. After a hurried meal he goes to the library and pores over a textbook till the time comes for a ward round, when he listens eagerly to every comment and again enters it in his book. At the other extreme is the footballer who strolls into the lecture a little late and does not really get into his stride as a listener till he has filled and lit his pipe and gets it drawing to his satisfaction. His notes are sparse, and at rounds he is attentive but not verbose. Yet when it comes to a practical task the second one approaches it with a common-sense outlook; when he is asked a question whose answer is not in the textbook he is able to see through the problem to its essentials and give an answer that may not be the right one but that embodies his personal experience; at examinations he beats his more studious fellow student, in the practicals at any rate, and when he goes into the world he makes a better doctor.

Most of us have passed through both of these phases, through spells of hard conscientious work and through spells of idleness. In the first we have acquired knowledge; in the second we have built up wisdom. In the first we have been worthy workers. In the second we have made, or started the train that has brought us to, those personal contributions by which we hope to be remembered when we are dead. For the human mind which has been driven hard does its best work when the tension is outspanned and it is allowed to find the natural paths that shape themselves in idle periods.

For many of us the war has provided such a sabbatical break. We have worked hard even in uniform, but for long times we have remained idle. Then it is that we have discovered to our joy that the disconnected visions of our student days are all fitting into a pattern. Figuratively, we have sprung like Archimedes from the bath in which we have been dozing and have shouted "Eureka."

I have enjoyed such periods of idleness more than most members of my profession. Since I became a surgeon I have twice been docked for six months for repairs—once after an illness, once after a motor accident. In addition I have spent more time in the forward surgery of war than any man. And war is the ideal alternative between feverish activity and leisure, between times when ideas crowd upon us and times when they can be worked out. It provides the tremendous stimulus of corporate loyalty, it brings the fundamental problems of injury and infection once again before us, and it gives us abundant opportunity to study them. Throughout my life I shall remember the entry into Addis Ababa in April, 1941, when I sat next to Dan Pienaar drinking the Duke of Aosta's wines in the Piccolo Gebbi, and the spell of idleness that followed in that grand and barbarous country. I shall think of weeks in the Western Desert when the clear air brought every faculty to life, when the distance at sunset took on every colour of brown, purple, and blue, and at night millions of stars shone with a brightness that seems to be seen only in the Egyptian sky.

Those happy days are past, but now, after three years of hard work in civil surgery, I have once again enjoyed the pleasures of idleness, the armchair existence of a five-days flight in a Plymouth flying-boat. And as it is the most recent arrivals in the aerodromes of the brain that are still circling the association centres looking for a suitable strip on which to land and night-stop, so it is that the problems of these stress diseases have been turning over in the recesses of my subconscious mind seeking their own clarification while I have been consciously looking down on that wonderful panorama of alternating arid waste and prodigal fertility that is Africa.

Thyrotoxicosis a Stress Disease

That thyrotoxicosis is in most cases a stress disease few will deny. As the thyroid is particularly linked up with the female sexual and reproductive cycle, thyrotoxicosis is above all a stress disease of women, and seems to have its origin most frequently in some emotional disaster connected with a love affair. It is, however, by no means unknown in men, and I have met it several times in the war in young officers summoned to take high rank and responsible posts and asked to bear a load of authority beyond their years. It differs from the other two stress diseases I have mentioned in that, once started, it is self-continuing, and no amount of idleness, no change of occupation or psychological adjustment, has any power to stay it. Though the thyroid gland is probably fourth in the chain of guilt, the basal ganglia, the hypothalamus, and the pituitary taking prior blame, it is responsible for most of the clinical manifestations of the disease, and in the reduction of its activity lies the only prospect of relief or cure.

The overactive thyroid may be damaged by *x* rays, poisoned with thiouracil, tricked into its own destruction by radioactive iodine, or pruned with a knife as required.

The results claimed for thiouracil show few grounds for satisfaction or even complacency. The mortality under treatment is at any rate 2%. Ten per cent. of patients are intolerant of the drug; of the remainder only 3% are cured—that is, remain symptom-free for a year or more after treatment has been stopped. The majority must remain for years under observation, with occasional return to a maintenance dose. Two per cent. develop agranulocytosis. In nearly all of them the goitre increases in size, it may become cystic and cause pressure symptoms, it may atrophy and lead to myxoedema, it may become malignant. Broders and Parkhill state that "thiouracil goitre is made of a cellular hyperplasia with mitoses very much in evidence, and so therefore more comparable to carcinoma."

The majority of patients treated with thiouracil eventually need operation because their thyrotoxicosis is not cured, because they dislike the disfigurement of a large goitre, or because cysts or haemorrhages are pressing on the trachea or oesophagus. They present the surgeon with a task considerably enhanced difficulty, for the thiouracil goitre is rigid, friable, haemorrhagic, and adherent, and remains so to some extent even after a long rest from the drug and a course of iodine. On the other hand, the mortality of operation in the hands of a practised surgeon working with a physician who shuns thiouracil is not more than 1%, and the proportion of patients cured—that is, able to return within a few weeks to a full and active life—is over 90%.

I have always felt that an operation secures the desired result more quickly, more certainly, and more safely than any other means, and, having within the last two years, like Omar Khayyám, heard great argument about it and about, I still come out by the same door to register my vote in the same lobby: indeed, after a week's reflection in the relative anoxia of 12,000 feet and under the soporific drone of four engines, I am prepared to be almost dogmatic. I hold that thiouracil has had a fair trial and has failed miserably, that it has no useful place in reputable therapy, and that its use should be prohibited except

those cases of thyrotoxicosis where operation has been definitely abandoned or where it must be postponed till after the performance of another and more urgent operation, such as one for cancer.

Of the operation I will touch only on a few points that interest me. We all use the collar incision, but none of us, I hope, use the Kocher incision. The collar incision follows a natural crease and the scar is invisible in six weeks; the Kocher incision is strongly curved, with the ends turned up like the moustache of a bomber pilot, and it leaves the horrible scars that may be seen any day in the streets of many Continental cities. Some of us cut across the infrahyoid muscles, some split them in the midline and retract them; I do the latter for no more than sentimental reasons. I have never seen any ill follow muscle cutting, but I do not believe access to the poles is helped appreciably thereby, for the first step in subtotal thyroidectomy is free mobilization of the gland by division of the subcricoid connective tissue fan that binds the upper border of the isthmus and the inner border of the two upper poles. I do not expose the recurrent laryngeal nerve, because I believe that to bare so fine a structure is to invite late involvement by scar, and because if I tie the inferior thyroid artery half an inch away from the gland and then cut in front of its branches in the sagittal plane I know the nerve is safe. I have not drained a thyroid for ten years. Drainage for bleeding is unnecessary, for no thyroid wound should be closed till haemostasis is beyond doubt. Oozing of serum may occur, for Nature abhors a vacuum and she abhors catgut even more, but when it occurs it occurs too late for a drain to help, and it can be removed by aspiration without disturbing the scar.

Duodenal Ulcer

Duodenal ulcer, again, is a stress disease. It is predominantly a disease of men, but it is getting commoner in women as they adopt men's clothes and habits and take their jobs; and whereas twenty years ago females formed no more than a tenth of any series, they now contribute a fourth. Unlike hyperthyroidism, duodenalism can be alleviated and occasionally cured if the stress is relieved and its source removed before scar tissue has converted the lesion into one incapable of satisfactory repair; but since to relieve stress in any particular case it may be necessary to change the man's business, to double his income, to stop his cigarettes, or to shoot his partner or his wife, cure by medical means is not always possible. Surgery is thus called on increasingly for the treatment of duodenal ulcer; but it can never provide a cure for the underlying stress, and must be looked on as no more than a treatment of complications. It is a good working rule that no duodenal ulcer patient should be sent to the surgeon until he is 45, or until perforation, stenosis, recurrent major haemorrhage, or constant pain in spite of treatment makes operation inevitable.

Whereas in gastric ulcer any operation that removes the ulcer and the scar around it is usually satisfactory, in duodenal ulcer no operation that does not permanently reduce the level of acid secretion to one of 20% N/10 NaOH or under is likely to give more than temporary relief or provide any safeguard against recurrent ulceration.

I hope I may, without further discussion, dismiss gastrojejunostomy and all forms of pyloroplasty as unsuitable for anything but a very old stenosis in a man old enough to die of natural causes before he gets a jejunal ulcer. I will dismiss vasoligation as summarily, for it is only necessary to visit the two places where it has been practised longest—Manchester and India—to learn how worthless it is. Two operations remain to be discussed—vagotomy and gastrectomy.

Vagotomy

Vagotomy comes to us with all the glamour of the laboratory and the personal recommendation of 57 professors. As I sat in the plane turning over the journals that the steward brought me I was constantly confronted by the advertisement of a face cream that was the final product of years of research and was now acclaimed by Hollywood stars and Mayfair beauties as the source of their loveliness. I seemed to recognize an old friend in Africa: "Vagotomy, I presume."

That vagotomy will reduce the volume and acid level of the gastric secretion in dogs, that it will stop the pain in all peptic ulcers in human beings and heal the majority, for a time at any rate, has been demonstrated beyond question. That it is a sound procedure, to be regarded as the first line of attack on the peptic ulcer problem, is as yet unproved.

A fundamental question that remains to be answered is how important the vagal mechanism of gastric secretion is in human digestion, and what part it plays in the aetiology of ulcer. Dogs have characters and habits very much like those of man—according to the French proverb, better; but they eat with a speed and an enjoyment that we can never hope to emulate. For them vagal secretion is all-important, for it provides an acid bath into which the eagerly awaited and hastily bolted meal drops. Men by custom turn their minds at meal-times to business or to love—in fact, to anything but food; they eat slowly, and the food remains in their stomachs for two hours or more. They need a vagal secretion for the first course, but they depend largely upon a hormonally activated secretion for the further digestion of their meal. Peptic ulcer patients differ from the normal not so much in the high level of their acid secretion as in its constant flow, which has no reference to the calls of meals. The fault with them is not that their acid is too high, but that it is poured into a stomach unbuffered by food.

Vagotomy cuts out completely the psychic flow of gastric juice, but it does nothing to abolish the chemically induced flow that comes later. If there is an ulcer it does not remedy the complications of that ulcer—the stenosis, the deformity, the fixation to surrounding structures; on the contrary, by diminishing gastric tone and delaying gastric emptying it precipitates the stasis which may still be latent, so that in most cases a short-circuit must be performed in addition to the vagotomy to prevent it. Once a fresh opening has been made the stomach is liable to be empty while the second uncontrolled wave of acid secretion is mounting, so that the new stoma is subjected to the dangers of unbuffered acid. In addition to these serious defects vagotomy brings in its train certain minor disabilities, belching and diarrhoea being the most constant, and now that results are coming to light it is clear that it is followed by recurrent ulceration more commonly than a well-performed gastrectomy. Vagotomy is certainly a simpler and, in the hands of those who should not be allowed to do major surgery at all, a safer operation than gastrectomy, but among competent surgeons it will probably come to be reserved for three groups of cases: for patients who have a return of pain or of ulceration after a radical gastrectomy well performed, for cases of gastro-jejunal ulceration to stop pain and bleeding and allow the patient to be made fit for a permanent reconstruction, and for old men with duodenal pain quite out of proportion to the very moderate ulcer that seems to be causing it.

Gastrectomy

Gastrectomy, on the other hand, is a big operation, and, when performed for duodenal ulceration, a difficult one. Yet it gives results that for excellence and permanence are

as yet unrivalled by any other method of treatment. To ensure such results five criteria must be satisfied:

1. The whole pyloric mucous membrane in which the secretory hormone is produced must be removed.

2. The acid-secreting mucous membrane must be ablated in those regions in which it is thick and rugose—that is, in the body of the stomach.

3. The lesser omentum must be divided right up to the cardia, in order to divide the left gastric artery at its origin and allow the lesser curve to swing free, and to interrupt the majority of the vagal fibres.

4. The stoma between the remaining stomach and the intestine must be no larger than the bowel into which it empties—that is, about 1¼ in. (3.75 cm.) in diameter.

5. The passage of food after leaving the stomach must be in an onward direction only.

None of the last three requirements is satisfied by the conventional Polya gastrectomy; all are fulfilled either by the modern Billroth I gastrectomy or by the valvular Billroth II gastrectomy.

Hypertension

Hypertension is not a new disease. It has killed many of the great men of history. Non-renal hypertension, or hyperpiesia, on the other hand, is a new disease and a stress disease. It is the price the millionaire pays for his directorships and the clerk for his failure. Its aetiology is unknown. A similar condition can be produced in dogs by clamping the renal pedicle; but, though in some instances human hypertension is associated with one damaged kidney and cured by its removal, such cases are curiosities; in most the renal function is normal, and the kidneys become involved only late in the disease.

The surgery of hypertension provides to-day one of the most interesting subjects for study and one of the most fascinating topics for discussion. Study is stimulated whenever a new problem appears or when a new discovery throws fresh light on an old one. Discussion is most enthralling when theories abound but proved facts are few.

Operations for the relief of the more distressing symptoms of hypertension are being performed in every country. You have done many here. Papers have appeared from the pens of many leading surgeons. You in Johannesburg have contributed some of the most interesting of them. I have done some operations myself, and was one of the first to do them in Britain, but I have spent far more time watching the work of others, reading their papers, listening to their discussions. And I speak to-day as one off duty, voicing those questions that disturb my idleness because I do not know the answers.

What is the cause of essential hypertension? I do not know, and if anyone does he has not told me. What justification is there for attempting to cure by a major operation a disease about which we are so ignorant? The justification of results: surgical treatment is admittedly empirical, but it does cure or improve patients who would otherwise get worse or die. In what way do we believe that blood pressure may be lowered by operation? Once more we do not know, and each surgeon has a different answer and modifies his operation according to the aim he has in view. There are at least five ways in which it may be suggested that the blood pressure can be lowered by operation on the sympathetic system: (1) by dilating the vessels of the lower limbs; (2) by dilating the vessels in the splanchnic bed; (3) by denervating the kidney; (4) by denervating the adrenals; (5) by dividing the sympathetic fibres to the heart.

Merits of Operation for Hypertension

What are the results of operation? Relief of the more distressing symptoms in nearly all cases; prolongation of life in any series in comparison with a similar series untreated or treated medically; temporary lowering of blood pressure in many, permanent restoration of blood pressure to normal in a few. Can we select those most suitable for operation, or judge beforehand by tests the extent to which any patient is likely to benefit? No. Tests are so fallacious that many have abandoned them. Can we judge from the figures published by surgeons which of them is getting the best results? No; because surgeons differ fantastically in their selection of cases for operation and in their assessment of post-operative results. At one extreme we have Professor X., who will operate only on patients under 40 who have normal renal function, no eye changes, and show a good response to sedation; he has no operative mortality and a high cure rate, but many of his patients might have got well anyway. At the other end is Professor Y., whose chief indications for operation are progressive headaches and failing vision, and who is undeterred by poor renal function and doubtful cerebral and coronary circulation; he has a number of operative and still more post-operative deaths, and most of those who survive are dead five years later, but he saves untold misery and adds some months of productive life to many useful citizens.

The two most popular operations to-day are the Smithwick, in which the three splanchnic nerves and the sympathetic chain from the eighth dorsal to the first or second lumbar ganglion are removed through a trans-diaphragmatic extrapleural approach; and the transpleural, in which the thoracic chain from the fourth dorsal to the first lumbar ganglion, and the three splanchnic nerves in their thoracic portion, are removed through a wide thoracotomy opening. The anatomical reason for this lengthy ablation is that sympathetic fibres have been shown to leave the upper thoracic chain and travel down to the coeliac plexus on the aorta without traversing the splanchnic nerves.

Now I am going to take courage, from the fact that Edinburgh and Manchester are five thousand miles away and that Boston and Ann Arbor are seven thousand miles away, to voice a few beliefs and disbeliefs.

I believe that an operation for hypertension is effective chiefly in so far as it denervates the kidneys and adrenals and that the vasodilatation it produces is variable in amount and secondary in importance. I do not believe that there is any significant difference in the relief of symptoms and the lowering of blood pressure obtained between a thorough subdiaphragmatic denervation and a Smithwick operation or between either of these and the extensive transpleural operation now fashionable in England. I do not attach much importance to filament-chasing, nor do I believe that nerves ever regenerate across gaps; at any rate they are never known to do so when we want them to.

Holding these views, I cannot muster any enthusiasm for the Smithwick operation. It is a Peet-Adson hybrid. It often damages the diaphragm and holes the pleura, and it does so to no purpose if it gives results not differing appreciably from the subdiaphragmatic operation. Still less can I grow lyrical over the transpleural operation, which is less thorough than the Smithwick at the lumbar end (I believe the more important end) of the sympathetic chain and is more thorough chiefly in dilating the intercostal vessels. I doubt whether the aortic filament is more than an anatomist's bauble and whether a knowledge of its occasional existence should persuade us to adopt an operation that is not demonstrably superior to others and that is followed by severe pain in the incision in quite a large number of patients. Though I am fully aware that I risk censure by the high priests of hypertension, I will state my own views, which, I reiterate, are those of an idle man, o

one who leans over the railings watching others digging a hole in the road and sees where they are doing it wrong.

Personal Views

First I should accept my cases only from a medical colleague. There are many things other than surgery that may cure hypertension. I well remember George Heuer, of Cornell University, relating two such cases at the meeting of the American College of Surgeons in New York in 1938. Both patients had hypertension that had proved refractory to every form of treatment and had been selected for surgery. One had a serious motor accident on the way to hospital; the other collapsed under the anaesthetic after the laminae had been removed but before any nerve roots had been divided. Both were cured. Rather than choose my cases myself, therefore, or rely on any form of test, I would take only those that had been under the care of a wise physician and accept his judgment that no change of occupation and no drug treatment could help them.

Secondly, I should refuse none except those with myocardial changes. The man who needs a high pressure to push blood through his coronary arteries will die the minute it is lowered. The others—those with poor kidneys, with a rising blood urea, who are unable to work because of their headaches, who are going blind—are also poor operative risks. They are no good to the surgeon whose eye is on statistics. On the other hand, they need our help more than any, and we can promise to help them. Their world is falling in ruins round them. We may send them prematurely to the next, but if we do not we give them a joy they had ceased to hope for. And the improvement seems to be largely unrelated to the fall in blood pressure. An operation that, judged by the sphygmomanometer, is a failure may yet relieve the patient of all his distressing symptoms.

Thirdly, I should, as my main line of attack, perform a bilateral subdiaphragmatic operation through an incision resecting the twelfth rib. I should resect the sympathetic chain from the third lumbar to the twelfth or eleventh dorsal ganglion, following the chain up by splitting the crus. I should pick up the splanchnics where they leave the diaphragm, divide them where they enter the semilunar ganglia, and follow them as high as I could through the diaphragm before cutting them again. I should do this operation on one side, and if the anaesthetist reassured me I should then do it on the other; if the drop in blood pressure was considerable I should do the second side three weeks later.

Fourthly, I should send the patient home after he had recovered from the double operation and reassess him after three months. If it seemed advisable to lower his blood pressure still further I should attack the cardiac sympathetic fibres by removing the second, third, and fourth dorsal ganglia, first on the left side, later, if necessary and after an interval, on the right. I should not divide the diaphragm nor should I open the pleura.

Well, gentlemen, I have talked so long of idleness that I have exhausted you. I have strained your patience so much that your pressures must be near to apoplexy and your duodenal ulcers to perforating. My thesis is the very simple one that the man who works hard and conscientiously does his most important work when he outspans his mind and allows it to wander at its own pace round the paths over which it has been rushing, and that science is advanced further in a shorter time by the informal chatter of a few like-minded friends over cocktails than by the formal exchange of papers or by any number of congresses.

The figure was planned by my former House Surgeon, Mr. Alan Parks.

THE DISCOMFORTS OF CHILDBIRTH*

BY

GRANTLY DICK READ, M.A., M.D.

When I was a student "on the district" I attended a girl whose reaction to childbirth greatly impressed me. When the head started to crown and the effort syndrome became obvious, with the evidence of suffering, I offered her such anaesthetic as I was allowed to give, and she would not take it, but between the contractions she smiled happily. After her baby was born I inquired why she would not take any anaesthetic freely offered her, and her reply has always remained in my mind. She did not take her anaesthetic because she did not want it. "It didn't hurt, doctor," she said; "it wasn't meant to hurt, was it?"

From the teaching of Crile and Head it became obvious to me that the discomforts of childbirth depended largely on the emotional and not solely on the mechanical factors which one had been taught were the cause of the pain. The fact that in childbirth there is usually a woman present is not always remembered even to-day. The performance of the mechanism of parturition is undertaken with a magnificent apparatus, but the fact that the woman has a brain, a mind, an extremely sensitive nervous system from which the impulses act and react upon the mechanism, is not so freely understood.

I asked myself how a woman could be expected to be successful in the task of bearing a child if she was not equipped with adequate knowledge. Would it be expected that the secretary of a business man would be successful if she had never handled pencil and typewriter? Yet women are allowed to enter upon the most important task of their lives untutored, untaught, and unassisted. I began, therefore, to educate my patients much earlier in pregnancy. From the time the women came to report that they were pregnant they were tactfully, gradually, and carefully initiated into the job they were about to perform. Their preparation included not only the normal clinical care of the antenatal clinic but they were taught relaxation and respiratory exercises, and during their short periods of rest while they were under instruction they had the art of childbirth explained to them. They were told that they had a uterus in which the baby was growing, that the uterus was made of muscle and grew with the child, and at each visit they were told the relative size of the child. They were told that the child would move and how to expect to "feel" their baby at about 17 or 19 weeks, as the case might be; they were told the position and were even shown a diagram of it. They were also told that they were already feeding the child and that it was necessary that they themselves should take some care of their own diet. They were told what they should eat and what they should not eat.

My patients were delivered on their backs, propped up in a position equivalent to squatting, but leaning, because the average European is not accustomed to squat. They held their child's hands before the baby was fully born and took it in their arms as soon as the cord was severed. Their happiness and complete freedom from pain were remarkable. Their refusal of anaesthesia was noted, and not infrequently they scorned and rejected the idea that they should be unconscious at such a great moment.

Nerve Supply of the Uterus

The neurological explanation of the phenomena I was witnessing was important. Some years previously Beckwith Whitehouse, in Birmingham, had worked very seriously on

*The substance of a lecture delivered before St. Mary's Hospital Medical Society on Oct. 28, 1948, with Dr. G. W. B. James presiding.

the nerve supply of the uterus. He came to the conclusion that the different muscle fibres of the uterus lying in different directions were supplied one by the autonomic nerves and the other by the sympathetic nervous system, and that these groups worked in harmony in much the same way as opposing muscle groups work in harmony—that is to say, when one group contracts the other relaxes. That is the mechanism whereby the expulsive muscles of the bladder and rectum and the corresponding sphincters work. With the release of the sphincters the expulsive muscles come into play. With the nerve supply of the uterus it was the same story. The circular inhibitory fibres should be relaxed, loose, and acting in harmony with the expulsive longitudinal fibres whose enormous power at full term is sufficient to dilate the cervix for the child to pass through, when the dilating force is augmented by the great effort of expulsion to drive the child through the birth canal.

Thus again the story of Head's thalamic pain loomed very largely into the picture. If in the presence of fear, as Crile and others had pointed out, the sympathetic nervous system throughout the body created a state of tension—a great protective activity to fight or fly from that of which it was afraid—the fear of labour would bring about rigidity by sympathetic nerve-fibre stimulation and the muscles and organs supplied by that nervous system would also be in a state of tension. The outlet of the uterus would be relatively rigid and the cervix resistant to dilatation. Thus there would be tension not only in the person herself but also in the apparatus of reproduction. The presence of fear is therefore a direct cause of somatic manifestation giving rise to the real pains of labour. Sir Charles Sherrington found that the uterus had only two pain-recording nerve endings—those which recorded laceration and those which recorded excess of tension above the normal mean.

Put those simple observations together and see what we have. In the presence of fear the outlet of the uterus is in a state of chronic contraction. The longitudinal fibres of the uterus struggle to release or burst through that resistance of the circular fibres of the uterus, increasing enormously the tension within the organ itself and thereby stimulating the receptors of pain. It is very simple and far more important therefore to remove the fear and the tension, for thus the amount of suffering in labour becomes negligible in comparison with that endured by the woman who is afraid. It is not enough for the woman to say, "I am not afraid." There are subconscious fears, fears formed and based on past associations or ideas. If these can all be removed then the labour of the human female becomes as easy and as enjoyable, in spite of the work and effort involved and the call upon her higher qualities, as it is in the lower animals.

Emotional Phases

But that again is not enough, and in order to understand exactly what emotional changes occur in labour we must study a labour which is normal—that is to say, a labour in an unanaesthetized woman, where the natural function is carried out without interference. It became possible to study these labours in large numbers when this series of events was implemented, when the fear was removed, and when the woman herself was in a natural state of relaxation and had no desire for anaesthetics or sedatives, for which, indeed, there was no necessity. Thus the study of the normal emotional phases of labour became possible, and, perhaps more interesting than anything else, in this idea was the discovery that labour is not a purely mechanical affair at all, but is closely associated with varying emotional phases. The chemists will shortly, I hope, be able to prove and demonstrate to us that many of the chemical constituents of the body vary with the emotions during labour. Particularly is that true of the blood sugar, as well as other biochemical factors.

But it is necessary to show how these emotional phases can be recognized, because one cannot conduct a labour to the full satisfaction of oneself and of the mother (and, I am beginning to believe, of the newborn child) unless one understands more than the purely mechanical function of parturition. It is not enough to wait until the head is showing and then put on a mask and gown and get a friend to give some "dope" and stand at the other end of the bed. That is not obstetrics, but it still goes on. Obstetrics is the understanding of the mind as well as the body of a woman in order that she may produce her child in the most natural way with the least injury to both mind and body—certainly the minimum of injury to the mind.

First Stage of Labour

The first stage of labour is the stage of initiation and expectancy. The antenatal anticipation of labour is a very boring time. There is no more trying period in a woman's life than the last two weeks during which she is waiting for the baby to be born. She not only wants her baby but she wants to get rid of the pelvic burden and to be again a freely mobile person. Women will go into labour in a condition of considerable exhilaration and animation, and until the cervix is dilated to between one-fifth and two-fifths (I am speaking of the primiparous woman) they will retain that state if there has been an intelligent and proper approach to labour.

When the cervix dilates further there occurs a very marked change. At two-fifths dilatation the large majority of patients will offer two manifestations. They will become quieter, although cheerful between contractions, and they will develop a pronounced malar flush. I would look for the malar flush appearing on the woman's face at two-fifths dilatation, because one knows then that the labour is truly progressive. The woman then begins to realize that she is completely helpless in relation to her uterine contractions. She is in the power of forces over which she has no control. Mere man would be alarmed under those circumstances, but woman fortunately has a better mentality.

When the uterus gets to three-fifths dilatation the woman has become serious in her demeanour—I do not mean distressed—but many of them are uneasy in their minds. What they desire is company. It is not physical pain which gives rise to the distress at three-fifths dilatation. It is the first emotional menace of labour. That can be diagnosed clinically perfectly well, and it is at that time that no woman should be left alone. There is no greater obstetric crime than to leave a woman in a room by herself at three-fifths dilatation and tell her, "You are not going to have your baby for perhaps ten or twelve hours. We have no time to look after you. Do not make a lot of noise, and we will come and see you from time to time." That is the way to ruin a woman's labour—indeed, a way to ruin her whole life, for pain and terror beyond control will give a psychological foundation to future experience that even time will not rectify.

If that phase is well cared for she will carry on with assistance and regain considerable confidence before the cervix is four-fifths dilated. This is the time when a sedative should be given, if it has to be.

Second Stage

Then we come to the transition from the first to the second stage. The transition is the great testing period of

labour, for then the cervix is dilated to its fullest. Many women definitely have pain at this stage even in the most normal labours, because of the tension brought about at the ultimate dilatation of the cervix. This is the second emotional menace of labour. Here is a true test of the woman's faith and fortitude. It is a period fraught with anxiety and perhaps pain. This is the time in normal labour when there is backache in about 50% of all cases. It should be recognized as the *pain period of labour*, and the average normal labour in which there is any pain will exhibit it at this stage.

As that emotional storm abates the woman will pass into the second stage of labour with the establishment of firm contractions, and she will be astonished at the disappearance of the backache and the sense of tremendous relief at being able to help herself. She will also greatly rejoice in the ability to push her baby through the birth canal, but I do not want to allude to mechanical factors now.

The third emotional phase occurs when the head reaches the pelvic floor. Many women will be inclined to give up their labour at this point. They will complain of all sorts of things; they will show a desire to escape. They will use all their female arts and wiles to persuade their attendants to do something for them. I have seen women full of fear and "suffering the tortures of the damned," although their pulse actually remained at 70, they were not perspiring, and they were breathing freely. The same women have explained to me afterwards that it was not a question of physical discomfort but a terror of anticipation from which they suffered. These women are quite honest with you and tell you exactly what they have felt at this time. One woman obstetrician whom I attended told me after her baby was born that I had not emphasized sufficiently the alarm then felt.

The fourth emotional menace is a real one because it varies with the conformity of the woman. In many women the ultimate outlet of the vulva is elastic, particularly up to the age of 26 or 27. At the crowning of the head, if a woman is in full control of herself, including respiratory control, it is not painful. At ages of from 26 to 34 the indifferent elasticity of the vulva may bring about some difficulty and at about half-crowning there is the onset of a sensation which most women describe "as if they are about to burst." It is not a feeling of actual tension or tearing, but of burning. If you ask them to describe the pain they will say "they are burning or stinging down below."

That sensation has a neurological basis. It is very largely due to the fact that certain nerve receptors go out of action before others (epicritic before protopathic), leaving nociceptors to record certain sensations of vulval sensibility. But this disappears quickly in the large majority of women and there is almost complete anaesthesia of the perineum within one-half to three-quarters of an inch of the vulval margin. There is no sensibility whatever to the tear. There is no pain. The woman feels only a sudden release, and afterwards what appears to be a massive laceration, which if it occurred in any other part of the body would cause considerable pain, has been sustained almost without her knowledge, and she is disappointed when she is asked to submit to the insertion of stitches.

Therefore there are not only the physical factors but four emotional factors which intensify the stimulus. The mind, however, can usually be trusted to take charge of the situation without the necessity for anaesthetics or even sedatives. The more experienced one becomes in these matters the more easily can these emotional factors be controlled. But they are quite definite phases and similar in all primiparae, and can be recognized as discrete entities. In multiparae it is a slightly different story, because the whole of a relaxed labour in a multiparous woman is so short that these phenomena run rather on the top of one another. Many women undertake parturition in the spirit which thinks of nothing except having the baby as soon as possible and with the greatest amount of happiness. Labours of two hours are no exception. There is no fear, and therefore only a desire for the child.

Third Stage

The third stage of labour is the only one which presents any anxiety to the normal obstetrician. It is the most difficult to carry out successfully. In a truly physiological labour the mother will be holding the hands of the child before the body is born. The head emerges and with the next contraction the shoulders are freed. The child is then rotated and lies upwards facing the mother. That rotation gives relief and takes the tension from the points where it has been at its greatest on the perineum. It is then we see an astonishing transfiguration of a hard-working woman employing the effort syndrome, which made her appear distressed, to a mother who suddenly becomes happy and smiling and sits up and waits for the baby to be fully born. Women in these circumstances will complain because the doctor is not yet able to tell them whether it is a boy or a girl. They will ask him to hurry, and I have to say to them, "I will hurry when you give me a contraction to hurry with." The sight of the infant brings on various emotional changes which are by some standards exaggerated. They speak of the child with fascinated wonder and enchantment. The most dull woman can burst out in exaggerated terms of delight at the sight of her child.

These children are all handed to the mother immediately the cord is cut. Every woman takes her child in her arms and holds it to her breast, not necessarily to suckle it. This stimulates a reflex contraction of the uterus which is definitely of physiological value. I think women were meant to take their babies when born. They will say what a funny-looking thing it is. "Is that the right colour, doctor?" "It really is like my husband."

Expulsion of the Placenta

Meanwhile the uterus contracts down to a firm solid ball. It is my custom to put a Spencer Wells forceps on to the cord close to the vulva, having a little tension on it, and hand the child to the mother. A basin is left underneath to receive the placenta. Not infrequently, as the mother plays with the child you will see the Spencer Wells drop into the receptacle and the cord lengthen five or six inches. It is not always sound practice to judge the position of the placenta by the height of the uterus. The placenta may be extruded and the height of the uterus not alter very much. But if the cord is seen to lengthen five or six inches, with possibly an ounce of haemorrhage, one may be sure that most of the placenta is in the vagina.

The mother is given a hot drink and the baby put in the crib at her side. Twenty minutes is the minimum time to expel the placenta. During that time while the urge to expel the afterbirth is occurring the happy woman is subjected to another wave of anxiety as the uterus contracts, although she cannot feel anything. One might imagine the expression of anticipation on her face to be an expression of pain. But the passage of the placenta is a source of very great satisfaction. It conveys a sensation which the woman will explain as the end of a glorious episode. The contractions of the uterus are needed for the completion of the function of childbirth, and there is nothing which takes place in childbirth without reason or cause.

Conclusion

Childbirth is being conducted in this manner in many parts of the world. There is no evidence yet that any school which has applied the psychosomatic approach to labour has withdrawn. No man who has understood the emotional has returned to the purely physical conduct of childbirth. There is more in this than the production of the child. At present there is a great wave of fear in the United States of America that the psychological state of married women is so altering that a factor is creeping into society which in a few generations may have a deleterious effect upon the whole nation. Two years ago—when I was in America—I found that the "mind of woman" received little or no care either before or during labour. Now, however, the importance to the mother and baby of this approach to childbirth has been accepted and demonstrated by Professor Herbert Thoms, of Yale University; Dr. Blackwell Sawyer, of New Jersey; Drs. Volmer and Marsh, of San Francisco; the Maternity Center Association, of New York; and others who have adopted these procedures. Their recent publications bear out with remarkable accuracy the conclusions drawn from the work in this country. Complete anaesthesia or unconsciousness in normal childbirth is an offence against Nature. Children who have been born according to the laws of Nature will be evidence of its psychological value as they grow to maturity. It will be easy to recognize those who were born with instinctive maternal guidance in the first few moments of their lives. These factors cannot be overlooked.

In a series of cases recently reported by the first great American university to adopt the procedure here outlined it was stated that 80% of all women—including abnormal labours—were fully conscious of all the sensations of the birth of their babies. I have found that in over 90% of uncomplicated births the women refuse analgesic or anaesthetic. The normal healthy woman of to-day, with a normal healthy labour, will tell you that the birth of her child was "a joy she would not have missed for anything." She sympathizes with those whom circumstances forced into insensitiveness or oblivion at that moment.

NON-SPECIFIC EFFECTS OF IMPURE PENICILLIN

BY

J. UNGAR, M.D.

(From the Research Division, Glaxo Laboratories, Ltd., Greenford, Middlesex)

It has occasionally been reported during the last three years that impure penicillin is a more effective chemotherapeutic agent than the purified crystalline material. This view was based on the laboratory study of various penicillin samples, using either the protection of animals (Hobby *et al.*, 1946, 1947; Welch *et al.*, 1947; Miller *et al.*, 1948) infected with streptococci, *Bact. typhosum*, or salmonella or the action on the motility of *Treponema pallidum* (Dunham and Rake, 1945). These observations seemed to indicate the presence in crude preparations of penicillin of a factor that increases its antibacterial action; this factor appeared to have so marked an effect on the action of penicillin that the term "enhancement factor" was thought justifiable. This reason probably also explains the suggestion, made in a recent annotation (*B.M.J.*, 1948), to take the retrograde step of reverting to the earlier production methods and the use of impure penicillin.

It should be noted, however, that the data available explain neither the nature of the "enhancement factor" nor its action (Welch, 1947; Hobby *et al.*, 1947; Fischbach *et al.*, 1947; Pratt *et al.*, 1948). The individual observations are scanty and occasionally conflicting, but this much is certain, that the "enhancement factor" in the impurities is heat-stable, dialysable, and active in small amounts if added to purified penicillin G, K, or dihydro F (Welch, 1947; Hobby *et al.*, 1947). The issue is of importance to the whole problem of presentation, for penicillin may be distributed either as a pure product with specific pharmacodynamic properties or as a crude one in which largely unknown impurities are left. An investigation was therefore undertaken to determine (1) what part the impurities play in the activity of crude penicillin, and (2) the mechanism of any such activity.

With these objects in mind the main work of Welch *et al.* (1947) was first repeated, but using, on a units-per-weight basis, smaller doses of penicillin—just sufficient to protect mice against lethal infections with *Bact. typhosum* or streptococcus, which are those commonly employed in protective trials.

Materials and Animals Used

In this paper we are concerned with a substance or substances that may be present in certain samples of penicillin and are different from the essential therapeutically active constituents. It is therefore important to describe as precisely as possible the penicillin samples used in the experiments. There is some confusion in the penicillin literature owing to the various descriptions of materials used in laboratory and clinical investigations, descriptions that include such terms as "crystalline," "pure," "purified," "crude," "yellow," "white." It has been thought best to follow as closely as circumstances permit the descriptions accepted in this country for the purposes of the Therapeutic Substances Act.

Two preparations were used, differing in "purity." The first was "penicillin sodium salt," containing not less than 80% of penicillin G (penicillin II, benzyl penicillin); the other 20% presumably consisted partly of penicillin and partly of material devoid of penicillin activity. It varied in colour from yellow to almost white, according as the impurities contained more or less of pigmented substances derived from the mould. The other material used was "crystalline penicillin G sodium salt": it contained at least 95% of penicillin G and was a white macro-crystalline product.

For brevity the first type of product is referred to as IP and the second as CPG. The activities in international units were in conformity with accepted standards: the IP batches all had about 1,200 units per mg., the CPG 1,600 or over.

The mice used in the experiments were albinos of both sexes from an inbred colony derived from ancestors of the Strong A2 line. They weighed from 18 to 20 g. at the time of test. Rabbits, of no special strain, were used at body weights of 2.5 to 3 kg.; they received intramuscular injections of 10,000 units of penicillin.

Methods of Infection.—The procedure, including the method of infection, was similar to that of Welch *et al.* (1947), but differed from that of Hobby *et al.* (1947). Two different pathogens were used. A virulent strain of *Bact. typhosum*, having for our mice an LD50 of about 40,000,000 organisms, was injected, at ten times the LD50 of a 24-hour culture, by the intraperitoneal route. The other strain used was *β-Streptococcus haemolyticus* at ten times the LD50 of a 24-hour culture (blood agar), also intraperitoneally. Penicillin injections were given intraperitoneally in the morning, followed two hours later by the bacterial suspension. Treatment was given twice daily for four days and the number of mice surviving after seven days was recorded.

Inactivation.—For control purposes all IP or CPG solutions were inactivated with a penicillinase preparation from *Bacillus subtilis* (Ungar, 1944) and then heated at 80° C. for 30 minutes.

Comparison of IP and CPG

Table I gives the results of some comparisons of the two types of penicillin preparation with both kinds of infection. IP (K283) was a fairly old batch of material. The CPG was material from current production. In the experiment recorded in Table I, moreover, the batches CPG 5015 and CPG 5207 consisted of high-potency material made from a part of the same metabolism fluids that yielded, respectively, batches IP 5015 and IP 5207 of less-purified product. Thus the latter may be regarded as consisting of the former together with the natural impurities. A number of experiments like the one summarized here (but not involving the use of similarly comparable batches of IP and CPG) were carried out during a period of some 12 months with 18 other production batches of penicillin IP.

TABLE I

Substance	Penicillin Dose (i.u.)	Infection	No. of Animals Used	No. of Survivors
CPG	10	Streptococcus	36	24
CPG+IP K283 inactivated	10	,,	36	27
CPG	100	Bact. typhosum	36	5
CPG+IP K283 inactivated	100	,, ,,	36	15
CPG	50	,, ,,	12	0
CPG+inactivated IP 5015	50	,, ,,	12	2
IP 5015+inactivated CPG 5015	50	,, ,,	12	2
IP 5207+ ,, CPG 5207	50	,, ,,	12	2
IP 5015	100	,, ,,	24	12
	450	,, ,,	24	23
CPG 5015	100	,, ,,	24	8
	450	,, ,,	24	19
Control	—	,, ,,	12	0

From these experiments it would appear that mice treated with IP are sometimes better protected than mice treated with the same dose of CPG. The difference between their action in mice infected with streptococcus was not significant; indeed, in some tests mice treated with CPG showed a slightly higher survival rate than mice treated with IP. But our experiments confirmed the superior effect of IP in preventing *Bact. typhosum* infection of mice.

Blood Levels in Rabbits

The next series of experiments was designed to find out whether the estimation of blood levels of penicillin in rabbits after injection of IP would give an indication of the presence of the enhancement factor, as had been suggested by Welch (1947). Blood levels were estimated at 15-minute intervals for the first hour and then half-hourly. The rate of urinary excretion of penicillin was also estimated, to determine whether the less-pure penicillin had the effect of decreasing urinary excretion, as this might partly explain any higher penicillin blood levels.

All the penicillin samples which showed an enhanced activity in typhoid-infected mice were tested, as well as ordinary routine batches.

For each batch a group of four rabbits was used. The tests showed that the type of penicillin tested had no bearing on the levels of penicillin in the blood. Maximum levels were reached after 30–45 minutes; the levels began to fall after 60 minutes, reaching zero after three to four hours, irrespective of the kind of penicillin injected. It was found, however, that the levels of penicillin in the blood differed in individual rabbits, sometimes very considerably. This was apparent in two experiments in which groups of four rabbits were alternately injected with the same two batches of CPG and IP. On the first occasion the batch of IP gave higher blood levels in three of the four rabbits after 60 minutes than did the CPG. In the second test the first group of rabbits were injected with CPG and gave higher blood levels than the other group now injected with IP. The blood levels clearly depend to a large extent on the individual rabbits. This observation is already well known not only to laboratory workers but also to clinicians, who often record a wide range of penicillin blood levels in patients receiving the same dose of penicillin.

The amount of penicillin excreted in the urine of the rabbits was estimated during the day on catheter specimens and at night on samples collected in metabolism cages. The rate of excretion of penicillin in the urine and the amount of penicillin excreted over 24 hours did not show any difference with the two types of penicillin; with either, between 40 and 90% was accounted for in the urine after 24 hours.

Effect on General Resistance

As the increased effect of IP in our material could be demonstrated with *Bact. typhosum* infection but not with streptococcus, it seemed possible that if the blood levels of penicillin in mice behave similarly to those in rabbits we were here concerned less with the bacteriostatic action of penicillin, which should be "enhanced" similarly against both types of infection, than with an effect on the host, whose neutralization of bacterial endotoxin is being stimulated by the IP. This notion is supported by the fact that the enhancement effect can be shown if the mice are pretreated with IP; the optimal response occurs if the IP or the impurities present in IP plus CPG are injected into the peritoneal cavity before an injection of the infecting organism. In this event the impurities would be producing just the opposite effect to that of an intraperitoneal injection of mucin-coated bacteria, which enables micro-organisms of low pathogenicity (mainly endotoxin-containing bacteria) to cause a fatal infection in otherwise resistant animals (Miller, 1933). It is appropriate to mention that this effect of mucin is due to several factors, such as the inhibition of phagocytosis and an increased permeability of the barrier between the abdominal cavity and the blood stream (Olitzki, 1948).

To demonstrate, therefore, that the effect of the impurities is on the host rather than directly on the bacteria, we made a few experiments to compare any stimulating effect of the IP with that of colloidal substances known to have such an effect. For this purpose calcium oleate (a suspension of 0.75% calcium oleate in 0.5% gelatin) was used, and the experiments were performed on similar lines to those with IP and mice infected with *Bact. typhosum*. The mice were injected intraperitoneally in the morning with 0.05 ml. of calcium oleate and infected two hours later. The results are shown in Table II.

TABLE II

Substance	Dose in Units	No. of Mice Surviving out of 12
CPG + inactivated IP	100	9
CPG + ,, CPG	100	5
CPG + calcium oleate	100	12
IP	100	8
CPG	100	4
Calcium oleate	—	2
Control mice	—	0

Although the number of mice in each group was not large the results point to a positive enhancement effect of IP, whether inactivated or not, as well as of calcium oleate. The differences between the number of animals protected by CPG alone (4) and by CPG with inactivated IP (9) or with calcium oleate (12) are statistically significant at the 5% level.

Effect of Different Injection Routes

The method of treatment was next altered. One group of mice was treated intraperitoneally with CPG along with inactivated IP or calcium oleate. A second group was treated with CPG intraperitoneally and inactivated IP or calcium oleate subcutaneously. A third group was treated with inactivated IP or calcium oleate intraperitoneally and CPG subcutaneously (see Table III).

TABLE III.—*50 Units of Penicillin Into Each of 12 Animals*

Substance	Route of Administration	No. of Mice Surviving			
		A	B	C	Total
CPG + inactivated IP ..	Intraperitoneal	7	6	6	19
CPG + calcium oleate ..	,,	6	6	5	17
CPG	,,	11	10	6	27
Calcium oleate	Subcutaneous				
CPG	Intraperitoneal	10	10	6	26
Inactivated IP	Subcutaneous				
CPG	,,	4	3	4	11
Calcium oleate	Intraperitoneal				
CPG	Subcutaneous	2	3	3	8
Inactivated IP	Intraperitoneal				
CPG	,,	4	—	—	4
IP	,,	8	—	—	8
Control	—	0	—	—	0

A, B, and C indicate contemporaneous tests.

Intraperitoneal injection of double doses (100 i.u.) of IP or CPG, each into 12 mice, produced about 50% protection ; 12 unprotected negative controls all died.

From these experiments it seems justifiable to conclude that the simultaneous intraperitoneal injection of CPG and IP, or of CPG and the colloidal suspension, raises the survival rate of the infected mice above that of mice treated with CPG alone at the same dose level. It seems also that the subcutaneous injection of IP (or of the colloidal suspension) increases the effect of intraperitoneally injected penicillin above that produced by the IP and the penicillin injected at the same time by the intraperitoneal route.

Other Colloidal Agents

We also performed an experiment in which other colloidal suspensions, such as colloidal gold or copper (Crookes's "collosol"), were used in place of colloidal calcium oleate or IP. Sixteen hours before infection 60 mice were treated with 0.05 ml. of the colloidal suspension subcutaneously and 200 units of CPG intraperitoneally. Infection with *Bact. typhosum* by the intraperitoneal route followed, and treatment with the colloidal suspension subcutaneously and the penicillin intraperitoneally was given twice daily for four days. In this experiment, therefore, the period of pre-treatment was prolonged to 16 hours, and the treatment itself began about two hours after the infection.

The results after seven days showed that about 30% of the mice survived if pre-treated with the colloidal suspension or IP, but none survived if the colloidal suspension was given two hours after the infection. An injection of IP had an effect similar to that of pre-treatment with the colloidal suspensions, whereas CPG at the same dose as the IP protected only about 10% of the mice.

Leucocytosis in Peritoneal Fluid

The enhancing action of IP on CPG in the previous experiments can be partly explained by the results of the following investigation.

In the preliminary experiment with mice it was found that the normal amount of free peritoneal fluid was very small and that it varied considerably from mouse to mouse. It was therefore impossible to make even an approximate estimation of the leucocyte count in the peritoneal fluid. We therefore injected into the peritoneal cavities of mice 2 ml. of normal saline, killed the mice 40 minutes later, and estimated the number of leucocytes in the peritoneal fluid by the routine method of white-cell estimation in the blood, using 1% acetic acid as the diluent. The average number of leucocytes found was about 900–1,200 per c.mm. of the diluted peritoneal fluid, or a total leucocyte count in the peritoneal fluid of about 1.8–2.5 millions, assuming that the leucocytes were evenly distributed.

Having established the normal leucocyte count, we investigated the effect of intraperitoneal injections of calcium oleate, IP, and CPG on it. Groups of three mice were injected intraperitoneally with 2 ml. of saline containing one of the three substances. One hour later the mice were killed, the peritoneal fluid was removed, and the leucocyte count was estimated, with the results shown in Table IV.

TABLE IV

Substance	Amount	Mean Value of Leucocytes (3 mice)
IP	200 units	2,300/c.mm.
IP inactivated	200 ,,	1,860/c.mm.
CPG	200 ,,	1,200/c.mm.
CPG inactivated	200 ,,	1,260/c.mm.
Calcium oleate	0·05 ml.	1,430/c.mm.
Saline control	2 ml.	960/c.mm.

In a second experiment, in which groups of six mice were used, the leucocyte counts in the peritoneal cavities were estimated over a period of three hours after the intraperitoneal injection of IP and CPG, with the results shown in Table V.

TABLE V

Substance	Amount	Mean Value of Leucocytes (6 mice)	
		After 1 Hour	After 3 Hours
IP	200 units	2,000/c.mm.	9,300/c.mm.
CPG	200 ,,	1,075/c.mm.	5,400/c.mm.
Saline control	2 ml.	1,066/c.mm.	2,800/c.mm.

From these results the justifiable conclusion seems to be that intraperitoneal injection of IP causes a pronounced local leucocytosis in the peritoneal cavity. This leucocytosis probably results in an increased phagocytosis of the bacteria subsequently injected into the same cavity. This stimulated phagocytosis may be one of the factors contributing to the "enhancement effect" of IP.

Discussion

These experiments indicate that IP has a greater protective effect than CPG on mice infected with *Bact. typhosum*. This increase in activity was about 20–40 —i.e., 70 units of IP have the same effect as 100 units of CPG. These results confirm the reports of Welch *et al.* (1947) and of Hobby *et al.* (1947). In the results of treatment of streptococcal infections, no appreciable difference between our two types of penicillin was recorded. The more pronounced effect of IP in mice infected with *Bact. typhosum* is also consistent with the finding of Miller *et al.* (1948) that IP has a greater neutralizing effect on bacterial endotoxin (from *Salmonella aertrycke*) when injected intraperitoneally. The increased leucocytosis in the peritoneal cavity after injection of IP is probably a contributory factor in suppressing the endotoxin-containing bacteria.

We have also found that the protective action of CPG in infected mice could be increased by simultaneous administration of colloidal suspensions of calcium, copper or gold. The method of action of the colloidal suspensions in the presence of CPG may be similar to that of the impurities in penicillin—through increased leucocytosis in the peritoneal cavity. This finding indicates that the "enhancement" effect of the impurities in IP is possibly due to activation of certain defence mechanisms in the

host rather than to any direct action of the impurities on penicillin itself. This would explain why the enhancement effect cannot be demonstrated *in vitro*, and rules out any direct synergistic effect of the impurities on penicillin. We were not able to confirm that the enhancement effect of the impurities caused the higher penicillin blood levels reported by Welch (1947).

There are as yet no reliable clinical data to demonstrate that less-pure penicillin (from modern deep culture production) has any therapeutic advantages over pure products. Early favourable reports are based on observations with batches of uncertain penicillin content used in the treatment of venereal diseases, mainly gonorrhoea, which are known to respond even to small doses of penicillin. From the pharmacological point of view all the arguments are in favour of using the purest penicillin. It is better tolerated in high doses by sensitive tissues like those of the central nervous system and eye than are cruder products; it has less often been reported to produce allergic sensitization; and it is more stable.

Summary

It has been found that highly purified samples of penicillin G sodium salt were not so effective as less-purified material in protecting mice against infection with *Bact. typhosum*, but that the difference was not demonstrable with streptococcal infections. A suggestion is advanced that the enhancing effect of "crude" penicillin may be partly due to increased leucocytosis in the peritoneal cavity after injection of the impurities present, and it has been shown that certain colloids do produce this leucocytosis and the "enhancement" of purified penicillin.

References

British Medical Journal (1948). **1**, 795.
Dunham, W. B., and Rake, G. (1945). *Amer. J. Syph.*, **29**, 214.
Fischbach, H., Eble, T. E., and Levine, J. (1947). *Science*, **106**, 373.
Hobby, G. L., Burkhart, B., and Hyman, B. (1946). *Proc. Soc. exp. Biol., N.Y.*, **63**, 296.
— Lenert, T. F., and Hyman, B. (1947). *J. Bact.*, **54**, 305.
Miller, C. P. (1933). *Science*, **78**, 340.
— Hawk, W. D., and Boor, A. K. (1948). Ibid., **107**, 118.
Olitzki, L. (1948). *Bact. Rev.*, **12**, 149.
Pratt, R., Dufrenoy, J., and Strait, L. A. (1948). *J. Bact.*, **55**, 75.
Ungar, J. (1944). *Nature*, **154**, 236.
Welch, H. (1947). *Proc. Amer. Drug Manuf. Ass.* Annual Meeting, p. 137.
— Randall, W. A., and Price, C. W. (1947). *J. Amer. pharm. Ass.*, **36**, 339.

NEEDLE BIOPSY OF THE LIVER

WITH SPECIAL REFERENCE TO A MODIFIED GILLMAN TECHNIQUE

BY

RICHARD TERRY, M.D., M.R.C.P.
Medical Chief Assistant, St. Bartholomew's Hospital

In 1833, at St. Bartholomew's Hospital, Stanley punctured the liver in a case of suppurative hydatid disease. Ehrlich (Frerichs, 1884) obtained liver tissue by aspiration through a needle in research on diabetes, and Lucatello (1895) used a similar procedure for diagnosis. These early reports were followed by studies employing variations of the aspiration technique, but they were largely unsatisfactory. The present status of liver biopsy dates from the work of Iversen and Roholm (1939), and since then its value has become widely recognized.

Indications and Contraindications

The following circumstances have been judged to indicate the use of liver biopsy:

1. Jaundice.
2. Hepatic enlargement of unknown cause.
3. Malignant disease when hepatic metastases are suspected.
4. Hepatic disease in which precise diagnosis is otherwise difficult: fatty infiltration, acute, subacute, and chronic hepatitis.
5. Obscure disorders possibly due to systemic diseases accompanied by morbid changes in the liver, when other methods of diagnosis have proved inconclusive: sarcoidosis, amyloidosis, haemochromatosis, Gaucher's disease, abdominal reticuloses, aleukaemic lymphatic leukaemia, glandular fever, kala-azar, and schistosomiasis.
6. Portal hypertension—to determine whether the obstruction is intrahepatic and whether lipotropic therapy is required before operation.
7. Constrictive pericarditis—to determine the extent of hepatic damage before operation.
8. The treatment of patients with fatty infiltration, smouldering infective hepatitis, or insulin-resistant diabetes.

The contraindications may be listed as follows:

1. Haemorrhagic states, failing to respond to therapy.
2. Marked anaemia.
3. Absence of superficial liver dullness.
4. Senility.
5. Lack of co-operation of the patient.
6. Refusal of the patient to enter hospital. Watson (1948) reports that some persons are carrying out liver biopsy as an ambulatory procedure.
7. The suspicion of liver abscess, hydatid disease, or active cholangitis.
8. Absence of specific indication.

Mortality

There is a widespread opinion that liver biopsy is too hazardous to be adopted as a standard investigation, but this seems to be based upon mortality figures which include series before the discovery of vitamin K. The following are the death rates recorded in modern series:

	Deaths	Biopsies
Gillman (1948)	1	1,000
Sherlock (McMichael, 1948)	2	400
Roholm, Krarup, and Iversen (1942)	2	297
Volwiler and Jones (1947)	1	278
Beek and Haex (1943)	0	200
Davis, Scott, and Lund (1946)	0	79
Herrera and Pardo (1947)	0	72
Hoffbauer (1945)	0	65
Baron (1939)	1	48
Beierwaltes and Mallery (1946)	0	30
Total	7 (0·28%)	in 2,469

This mortality should be assessed in relation to the many accurate diagnoses obtained, but for a fuller appreciation it is necessary to examine the individual deaths.

Gillman's patient bled from an aberrant superficial artery in a "huge tuberculotic liver," and that author considered that the patient could have been saved if surgery had been available. Both Sherlock's patients died from haemorrhage and had such severe liver damage that puncture only precipitated the inevitably fatal issue. One had acute necrosis, and the other subacute necrosis, general paralysis of the insane, and rectal carcinoma (Dible, McMichael, and Sherlock, 1943). The two patients of Roholm *et al.* (1942) died from haemorrhage, and although a haemorrhagic state existed vitamin K was not given. One had obstructive jaundice due to carcinoma of the head of the pancreas, and the other glandular metastases in the portal fissure. Volwiler and Jones's fatality followed puncture of the right main hepatic vein 4.5 cm. from the surface of a friable amyloid liver; intrahepatic bleeding led to gross splitting of the liver. Baron's patient had metastases in the liver and elsewhere and bled from a tear 1 cm. long; the bleeding and clotting times were not estimated.

Thus these seven deaths occurred where the prognosis was already hopeless, and three might have been avoided had the haemorrhagic state been treated.

There have been other deaths, but they have been omitted in arriving at the percentage of 0.28%, either because they occurred prior to knowledge of vitamin K, as the two deaths in 100 biopsies by Bingel (1923) and the two deaths in 160 biopsies by Olivet (1926), or because they have been reported without reference to total biopsies.

Bingel's two deaths were from haemorrhage. One patient had carcinoma of the stomach with hepatic metastases, and the other pernicious anaemia with only 500,000 erythrocytes per c.mm. In neither was the haemorrhagic state investigated. Olivet's two patients died from haemorrhage: one had extensive liver metastases and the other pernicious anaemia with haemoglobin 15%, and again no examination was made of the haemorrhagic state.

Raby (1944) reported one death from puncture of a superficial branch of the portal vein in a woman aged 79 years with jaundice of obscure origin: 1.5 litres of blood were found in the peritoneal cavity; the clotting time was normal. He had a second death three days after biopsy of a man aged 85 years, at whose necropsy no cause of death was found. He felt that the age of these two patients was of some importance. Hoffbauer (1947) quotes an unreported death due to perforation of the colon: the subcostal approach was used although the liver was of normal size.

Thus since 1939 only three deaths have been reported in patients whose prognosis was not already hopeless: of these, two were in patients aged 79 and 85 years, and the third was associated with questionable technique. However, in spite of these reassuring findings, it is necessary to realize that these figures have been obtained by skilled operators constantly using the procedure and that the casual employment of liver biopsy must lead to disasters.

Choice of Method

Iversen and Roholm (1939) used a trocar and cannula 17 cm. long with 2 mm. bore, ending in three sharp points, with a syringe to aspirate the liver tissue. Their method entailed insertion of trocar and cannula into the liver, removal of trocar, further insertion of cannula, attachment of syringe to cannula, withdrawal of syringe plunger, and finally removal of syringe and cannula. These six manipulations required the presence of the cannula within the substance of the liver for 10–15 seconds, during which the patient had to hold his breath. The syringe and cannula occasionally became disconnected at critical moments and the liver tissue, being sucked into the syringe, often broke up. Sherlock (1945) used a similar instrument, but changed to a smaller bore after 126 biopsies with two deaths.

In the U.S.A. the instruments described by Roth and Turkel (1944) and by Silverman (1938) have been preferred. In the Roth–Turkel method a short trocar and cannula are introduced about 1 cm. into the liver, the trocar is removed, and the tissue is punched out by a second longer cannula passed through the first; finally, suction is applied with a syringe. Adapted to liver biopsy by Tripoli and Fader (1941), the Silverman needle differs from the Roth–Turkel in that the longer cannula is split longitudinally and both halves tend to spring apart. Having punched out the tissue with the split cannula passed through the short cannula, the latter is advanced until both tips are level, and then both are withdrawn together, no suction being necessary. These methods have the disadvantages of undue time spent within the liver, frequent failure, and, except for the Silverman method, fragmentation of the specimen.

Watson (quoted by Greene, 1944) failed to obtain tissue for examination in 40%, Iversen and Roholm (1939) in 22.5%, and Hoffbauer (1947) in 23% of his first 65 attempts. The problem of failure has usually been approached by modifying the end of the cannula; the cannula of Franseen (1941) merely had three sharp teeth instead of the three sharp points of the Iversen–Roholm needle. Herrera and Pardo (1947) describe an ingenious arrangement of thread which cuts through the core at its base.

The instrument evolved by Gillman and Gillman (1945) overcame these various defects, having only 5% of failures. The following report is based upon a modification of their instrument and technique: 72 biopsies have been carried out without complication, and failure has been experienced on six occasions.

Description of Modified Gillman Instrument

The instrument is a needle mounted upon a 20-ml. syringe with a stylet fitted to the plunger (Fig. 1). The incorporation of syringe, needle, and stylet in one instrument allows all the manipulations of the Iversen–Roholm method to be carried out in a single brief movement. Fig. 2 gives details of construction. A 2-mm.-bore needle is used as a routine, but when there is any likelihood of undue bleeding one of 1.8-mm. bore is substituted. The needle has a bevelled point which produces a linear incision in the liver capsule, whereas blunt-ended cannulae make a round hole. The whole circumference of the end of the needle is internally bored to give a knife edge. An adjustable depth guard is mounted on the needle. The stylet has a flattened side allowing pressures within the syringe to be transmitted to the needle. The spring catch fitted on the syringe cap engages notches on the plunger rod and maintains the plunger in position after suction is applied. These notches are placed at intervals of 1 cm. and permit variation in length of the liver core.

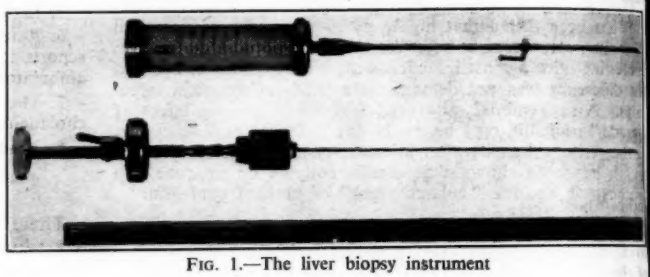


FIG. 1.—The liver biopsy instrument

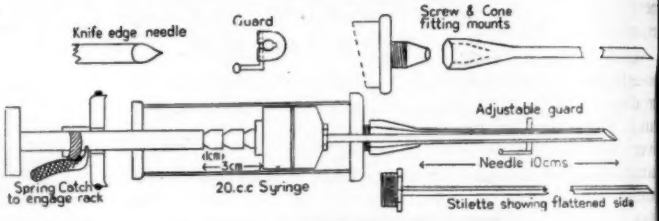


FIG. 2.—Showing details of construction

Method

Since the patient's co-operation is essential, a preliminary visit is made to gain his confidence, and the operation is referred to in vague terms. No biopsy is done in the presence of increased prothrombin, bleeding, or clotting times. Vitamin K is given as a routine on the two days preceding biopsy and longer if necessary; with jaundice, menaphthone 20 mg. is given intravenously, and without

jaundice 10 mg. t.d.s. by mouth. Two pints (1.14 litres) of blood are held available. Morphine, ¼ gr. (11 mg.) subcutaneously, is given 30 minutes beforehand and, if the patient is unduly nervous, phenobarbitone 1 gr. (65 mg.) an hour previously.

The biopsy is carried out in the ward. The patient lies supine with his right side close to the edge of the bed and his right hand behind his head. The superficial liver dullness is mapped out and a point selected one space below its upper level, usually the seventh intercostal space, in the anterior axillary line. This point is marked by pressure with the fingernail, and the area is swabbed with ether.

A 10-ml. syringe is used to introduce 8–10 ml. of 2% procaine, at first with a No. 20 needle for the skin weal and then Nos. 14 and 1 for the deeper tissues. Care is taken over infiltration of the diaphragm and liver capsule with the breath held in expiration. The field of operation is then screened from the patient's direct view and the skin incised for about ¼ in. (0.8 cm.).

The piston is lubricated with sterile liquid paraffin, the instrument assembled, and smooth working confirmed. This interval allows the analgesic to take effect, gives the patient a moment's relaxation during which he can practise holding his breath in expiration, and permits one to see how long the skin incision bleeds.

The right hand grips the syringe barrel and the left steadies the needle. With the bevels of needle and stylet in apposition, the point is introduced through the skin incision and advanced with a rotary movement. A "give" indicates penetration of the intercostal space, and, with the patient holding his breath, the point is advanced until liver resistance is felt; the point is then retracted just clear of the liver. This manœuvre allows one to judge the thickness of the parietes and to adjust the depth guard, and is especially important with ascites.

After further breaths the patient is told, "Breathe in, breathe out, stop breathing." ("Hold your breath" usually produces a further inspiration.) The biopsy is then carried out. The point is first advanced about 1 cm. into the liver, and then, with the left hand gripping the syringe handle and maintaining its position (and therefore the position of the stylet), the needle is advanced *sharply* into the liver by thrusting the syringe barrel forwards with the right hand. These are precisely opposite movements to those used in aspirating an abscess, when the barrel is held stationary and the plunger withdrawn. The barrel is advanced an average of 3 cm., which determines the depth of penetration into the liver. The left hand moves to the front of the barrel, and the whole syringe is quickly rotated through 360 degrees and immediately withdrawn.

The core is gently extruded into a glass tube 5 cm. long and of 3 mm. bore, and placed in 10% formol-saline. A dry dressing covers the skin incision.

Aftercare.—The patient remains semi-recumbent for six hours and in bed until the next day. Pulse readings are taken every 15 minutes for two hours and hourly for six hours. The general condition is closely watched. A mild analgesic is given one hour afterwards and a hypnotic in the evening.

Comment on Method

The intercostal approach has been adopted because it appears safe and easy provided the superficial liver dullness is carefully recorded. The costo-xiphisternal angle approach of Gillman and Gillman has not been used because most patients dislike punctures near the praecordium, and, while it is clearly a safe method in their hands, the inability to map out the liver in this area lessens one's confidence. Gillman and Gillman have expressed their fear that the intercostal route might lead to haemorrhage from diaphragmatic vessels, but if the core is punched out beyond the liver capsule this risk must be small. Davis *et al.* (1946) advise the subcostal approach because of the danger of tearing the liver should the patient breathe with a needle fixed in an intercostal space, but the abdominal wall appears to grip the needle enough to tear a soft liver, while livers of normal consistency are unlikely to tear. The subcostal route has led most frequently to perforation of hollow viscera; Baron (1939), using this route, has reported a fatality from a tear of Glisson's capsule. The progress of the needle through the rigid resistant intercostal space is more easily judged and controlled than through the soft resilient abdominal wall. There is no need to restrict biopsy to patients with hepatic enlargement when the intercostal route is used.

The procedure should be painless. With imperfect analgesia, pain radiates to the right shoulder and epigastrium. General anaesthesia was employed only once, and it proved impossible to assess the patient's condition afterwards. The skin incision eases introduction of the cannula, avoids confusing the pathologist with skin fragments, and allows recognition of any bleeding state.

Failure may occur either because the core remains attached at its base or because the needle passes between the liver cells without punching out a core. Experiments on cadavers, passing the needle through the entire thickness of the lower part of the liver to eliminate the former possibility, demonstrated that failure always followed a slow passage of the needle, but when it was introduced rapidly a core was always obtained. Thus success depends upon thrusting the needle into the liver sharply, and it is useless to proceed unless the instrument is working smoothly. The cutting edge of the needle must be kept sharp. Removal of the core from the deeper part of the liver avoids leaving a bleeding gap in the capsule or cutting a hole in the diaphragm, and rules out misleading subcapsular histology.

Gillman and Gillman advise full withdrawal of the plunger after the needle has been advanced. This must stretch and may break the core; it adds a further manipulation and has not been found necessary. Nor has their method been followed of rotating the barrel on the plunger, rather than the whole syringe, through 360 degrees, as the rotation is more quickly achieved with both hands on the barrel. Since the stylet remains within the needle the core is not sucked into the syringe and so escapes damage.

The time spent by the cannula within the liver is seldom mentioned in the literature, but Volwiler and Jones (1947) recommend aiming at less than 10 seconds. Gillman and Gillman give 15 seconds, but this includes penetration of the abdominal wall. Stopwatch timing of the present method has given times of 1.5 to 3.5 seconds within the liver.

Difficulties.—Women are more apprehensive than men, and present extra difficulty owing to their deeper subcutaneous tissue and the frequent need to retract the right breast. Cirrhosis has special problems. A shrunken liver may be difficult to locate. Distortion may swing the gallbladder into a vulnerable position. Fibrosis is the cause of many failures and ascites is a well-recognized obstacle, but they have not caused failure in the present series. Finally, the histology of the core may be normal in the presence of gross cirrhosis, a limitation to which Himsworth (1947) and Learmonth (1947) have drawn attention. The six failures in the present series were attributed to instrumental problems in four cases and inexperience in two; in all six patients the biopsy was successfully repeated.

Inspection of the Core.—The small glass tube protects the core, keeps it straight, and facilitates naked-eye

examination. In the present series the core from each case of obstructive jaundice has shown easily visible green spots scattered throughout, while in each case of parenchymatous jaundice the core has been uniformly coloured. Fragmentation of the specimen is suggestive of cirrhosis and has been observed where the histological report was normal, gross cirrhosis being found at operation for porto-caval anastomosis. Metastases show as pale homogeneous areas, and are found more often than might be expected; foci of lymphadenoma have the same appearance. The greasy appearance stated to characterize fatty livers has not yet been observed. Apart from these conditions, considerable variation in the appearance of the core is compatible with normal histology.

Sequelae

There is often slight aching in the right hypochondrium, and occasionally pain in the right shoulder. This pain seldom lasts more than 24–36 hours and causes no distress. Of the present 72 biopsies 47 have had this reaction. 21 cases denied any pain. In four there was more severe pain, starting suddenly 1–8 hours after biopsy; but no anxiety was caused, and one patient readily agreed to a further biopsy. No other complications have arisen. Chest radiographs of ten patients have shown neither pleural effusion nor pneumothorax.

Complications reported in the literature are infection, perforation of a hollow viscus, and haemorrhage. Infection has been rare. Perforations of the colon, duodenum, and gall-bladder have been reported, usually without any reaction, though non-fatal biliary peritonitis and one death from colonic puncture are recorded. Haemorrhage has followed a tear of the capsule or of a superficial hepatic vessel. Haemothorax requiring blood transfusion has been twice noted.

Summary

Some indications for liver biopsy are given.

A mortality of 0.28% is presented, occurring in 2,479 biopsies reported since 1939, and the published deaths are examined in detail.

A description is given of a method of liver biopsy which has been employed in 72 biopsies with neither death nor significant complication.

I am indebted to Dr. R. Bodley Scott for his encouragement and ready assistance; to Dr. Geoffrey Bourne and the physicians and surgeons of St. Bartholomew's Hospital who have allowed me to carry out needle biopsy on their cases; to Mr. W. J. Ward, curator to St. Bartholomew's Hospital, and Mr. W. T. Harris, of W. H. Bailey and Sons, for their help in producing the biopsy instrument; to the photographic department of St. Bartholomew's Hospital for the illustration; and to the nursing staff of St. Bartholomew's Hospital for their careful reports.

REFERENCES

Baron, E. (1939). *Arch. intern. Med.*, **63**, 276.
Beek, C. van, and Haex, A. J. C. (1943). *Acta med. scand.*, **113**, 125.
Beierwaltes, W. H., and Mallery, O. T. (1946). *Univ. Hosp. Bull., Ann Arbor*, **12**, 13.
Bingel, A. (1923). *Ver. dtsch. Ges. inn. Med.*, **35**, 210.
Davis, W. D., Scott, R. W., and Lund, H. Z. (1946). *Amer. J. med. Sci.*, **212**, 449.
Dible, J. H., McMichael, J., and Sherlock, S. P. V. (1943). *Lancet*, **2**, 402.
Franseen, C. C. (1941). *New Engl. J. Med.*, **224**, 1054.
Frerichs, F. T. (1884). *Ueber den Diabetes*, Berlin, p. 272.
Gillman, T. (1948). *J. Amer. med. Ass.*, **137**, 243.
—— and Gillman, J. (1945). *S. Afr. J. med. Sci.*, **10**, 53.
Greene, C. H. (1944). *Arch. intern. Med.*, **73**, 349.
Herrera, G., and Pardo, V. (1947). *Arch. Path.*, **44**, 393.
Himsworth, H. P. (1947). *Lectures on the Liver and its Diseases*, Oxford.
Hoffbauer, F. W. (1945). *Lancet*, **65**, 246.
—— (1947). *J. Amer. med. Ass.*, **134**, 666.
Iversen, P., and Roholm, K. (1939). *Acta med. scand.*, **102**, 1.
Learmonth, J. R. (1947). *Ann. roy. Coll. Surg.*, **1**, 299.
Lucatello, L. (1895). *Lav. Congr. Med. interna*, p. 327.
McMichael, J. (1948). *J. Amer. med. Ass.*, **137**, 234.
Olivet, J. (1926). *Med. Klinik*, **22**, 1440.
Raby, K. (1944). *Nord. Med.*, **24**, 2161.
Roholm, K., Krarup, N., and Iversen, P. (1942). *Ergebn. inn. Med. Kinderheilk.*, **61**, 635.
Roth, A. A., and Turkel, H. (1944). *J. Urol.*, **51**, 66.
Sherlock, S. (1945). *Lancet*, **2**, 397.
Silverman, I. (1938). *Amer. J. Surg.*, **40**, 671.
Stanley (1833). *Lancet*, **1**, 189.
Tripoli, C. J., and Fader, D. E. (1941). *Amer. J. clin. Path.*, **11**, 516.
Volwiler, W., and Jones, C. M. (1947). *New Engl. J. Med.*, **237**, 651.
Watson, C. J. (1948). *J. Amer. med. Ass.*, **137**, 242.

SEVERE RENAL FAILURE AFTER ADMINISTRATION OF APPARENTLY COMPATIBLE BLOOD

BY

A. C. BUCHAN, F.R.C.S.Ed.

Plastic and Jaw Injury Unit, Bangour Hospital, West Lothian

AND

JOHN WALLACE, M.B., Ch.B., B.Sc.

Glasgow and West of Scotland Blood Transfusion Service

The literature on the Rh blood group is vast, but the recent appeal (*British Medical Journal*, 1948, **2**, 344) to publish observations on this subject has prompted us to record the case given below.

The development of irregular haemagglutinins after repeated blood transfusions is now well recognized. Callender and Paykoç (1946) reported that, out of 15 Rh-negative patients transfused with Rh-positive blood, only one developed rhesus antibodies, and Gunz (1946) observed that out of 10 Rh-negative patients who received multiple transfusions two were found to have developed antibodies. These observers point out, however, that had the tests for blocking antibodies (Race, 1944; Wiener, 1944) been performed the percentage of sensitized patients might have been higher. This suggestion is confirmed by Diamond (1946), who in a series of 2,500 Service men transfused under wartime conditions was able to demonstrate rhesus antibodies in the serum of about 50% of the Rh-negative individuals. Hattersley (1947), in a similar but smaller series, demonstrated rhesus antibodies in 11 (55%) out of 20 Rh-negative cases transfused under Service conditions. In all Hattersley's cases the antibodies were in the "blocking" or "incomplete" form, and direct compatibility tests of the patient's serum against *saline-suspended* Rh-positive cells would not have shown agglutination. However, in spite of this apparent compatibility the transfusion of Rh-positive blood to such a patient would result in a haemolytic reaction. It is for this reason that the following case is presented.

Case Report

A corporal aged 24 received a severe facio-maxillary injury on Jan 1, 1945. At that time he was given 5 pints (2.84 litres) of Group O blood in the course of 36 hours. His Service records make no mention of any reaction to these transfusions.

On July 24, 1946, a bone-graft operation was performed by Mr. A. B. Wallace. During the operation the patient's condition deteriorated, but a satisfactory rise in blood pressure followed the transfusion of 2 pints (1.14 litres) of Group O blood which appeared compatible on direct matching with the patient's serum.

On the morning of July 25 his condition was poor, his pulse rapid and of small volume, and his blood pressure 88/50. His collapse was attributed at the time to post-operative shock. One pint (570 ml.) of plasma and 1 pint of blood were given and within four hours his general condition had improved, the blood pressure being 106/68. This latter blood was Group O and appeared compatible with the patient's serum.

On the 27th he complained of nausea and vomiting, and his urine was blood-red in colour. The microscopical report

on the urine was : "Vast numbers of red blood cells and a few pus cells." The urinary output was 560 ml. in 24 hours.

By the morning of the 29th the urine was clear to the naked eye, but the microscopical report stated that a few red cells were present. The nausea and vomiting were more severe. Next day his general condition had deteriorated. Investigation of the blood chemistry gave the following results : urea, 340 mg. per 100 ml. ; chlorides, 491 mg. per 100 ml. ; uric acid, 4.1 mg. per 100 ml. ; plasma albumin, 3.6 g. per 100 ml. ; plasma globulin, 1.9 g. per 100 ml. Analysis of the urine showed : chlorides, 0.1 g. per 100 ml. ; urea, 1.3 g. per 100 ml. ; urinary output, 660 ml. in 24 hours. Because of the increasing vomiting a slow glucose-saline infusion was started on July 30.

The patient remained in a state of uraemia until Aug. 4, when a diuresis occurred, 5.25 litres being excreted in 24 hours. The specific gravity of the urine, which had remained constant at 1010 since the operation, now began to vary, thereby showing the return of the kidney's concentrating power. From this time the blood chemistry revealed a gradual return to normal. On Aug. 10 analyses showed : urea, 55 mg. per 100 ml. ; uric acid, 4 mg. per 100 ml. The blood pressure on July 30 was 154/96 and on Aug. 3 it rose to 206/120.

Convalescence was slow. Renal function was investigated by the water concentration, the urea range, and urea-excretion tests in October, and all showed a normal degree of kidney function. Blood pressure was then 128/70.

Special Investigations.—Not until six weeks after the transfusions had been given were these performed, so a complete investigation was not possible. The results were : patient's blood group, O, Rh-negative (genotype rr) ; patient's serum contained anti-A agglutinin, titre 1/32, anti-B agglutinin, titre 1/16, and incomplete anti-D agglutinin, titre 1/8.

Compatibility Tests.—The routine test of the patient's serum against twelve random Group O cells suspended in physiological saline showed no agglutination. However, when the red-cell suspensions were prepared with AB serum instead of saline there was agglutination of the Rh-positive but not of the Rh-negative cells. Although no agglutination of the Rh-positive cells occurred in the saline suspension, these cells showed that they had been sensitized by a rhesus antibody when tested by the indirect anti-human globulin reaction (Coombs *et al.*, 1945).

In the accompanying Table the total fluid intake, urinary output, daily urinary excretion of sodium chloride and urea, and the level of the blood urea are shown.

Table Showing Urinalysis

Day after Transfusion	Total Fluid Intake (ml.)	Urinary Output (ml.)	Total Daily Urinary Excretion		Blood Urea (mg. per 100 ml.)
			Chloride (g.)	Urea (g.)	
1st ..	—	—	—	—	—
2nd ..	—	150	—	—	—
3rd ..	—	560	—	—	—
4th ..	2,490	600	—	—	—
5th ..	1,590	630	0·6	8·1	—
6th ..	2,190	660	0·7	8·6	340
7th ..	2,580	1,080	1·1	14·4	320
8th ..	2,730	1,380	3·5	18·4	340
9th ..	3,090	1,920	4·9	25·5	340
10th ..	4,050	2,970	9·9	39·6	340
11th ..	5,100	3,000	9·0	42·0	325
12th ..	4,740	5,250	6·8	73·5	270
13th ..	4,860	5,190	—	78·0	230
14th ..	5,010	4,800	6·2	92·0	210
15th ..	4,470	4,740	5·2	74·2	150
16th ..	3,840	3,870	—	—	—
17th ..	3,870	3,480	—	—	—
18th ..	4,080	3,390	4·1	66·0	55
19th ..	2,850	2,790	—	—	—

Before the onset of a copious diuresis on the twelfth day there had been a gradual daily increment in the 24-hour urinary output. For a few days after the onset of the diuresis the urinary output was greater than the total fluid intake. Muirhead *et al.* (1948) found that with the onset of diuresis not only was the water excretion markedly raised but the daily urinary excretion of sodium chloride was greatly increased. These workers suggested that the renal tubules had recovered sufficiently to allow for urine volume production, but that the recovery was not yet advanced enough to allow for the conservation of water and salts. In the present case there was a marked increase in the daily excretion of urea, but the excretion of sodium chloride, while increased, remained within normal limits. It would seem that the kidney had recovered sufficiently to conserve sodium chloride. It has been emphasized (Muirhead *et al.*, 1948) that with the onset of the diuresis the kidneys may discard water and salts to the extent of causing pronounced dehydration or even death. It is therefore essential in the treatment of this phase to replace the water and salt lost from the body.

Discussion

The differential diagnoses considered at the time of the reaction were: (1) *Haemolytic transfusion reaction*:—This was considered unlikely on account of the careful compatibility tests made in the hospital laboratory and in the absence of the classical features, such as rigor, pain in the back, fever, or jaundice. There was no question of the blood having been overheated or being haemolysed by faulty or prolonged storage. (2) *Sulphonamide haematuria* can be excluded, as the patient was receiving penicillin but no sulphonamide drugs. (3) *Acute nephritis*:—This appeared the most likely diagnosis in view of the picture of uraemia associated with oliguria, red cells in the urine, and hypertension. Against such a diagnosis, however, was the absence of any recent infection, the absence of casts, and the low specific gravity of the urine.

As a haemolytic transfusion reaction was considered unlikely at the time, no special investigations were undertaken in the hospital, apart from checking on the ABO grouping of the patient and the donors and repeating the compatibility tests. These routine tests were satisfactory.

At the time of the special investigations six weeks later it was confirmed that the findings in the hospital laboratory were substantially correct, but the additional investigations revealed that the patient was Rh-negative and had "incomplete" rhesus antibodies in his serum. The development of these antibodies probably followed the original transfusion at the time of wounding in 1945. The transfusion of Rh-positive blood to an Rh-negative patient with "blocking" antibodies would then result in a haemolytic reaction, and it is believed that this is the explanation of the severe renal failure which developed.

There are several points about this particular case which seem worthy of mention.

1. Absence of the Classical Features of a Haemolytic Reaction

The absence of such reactions as tingling sensations of the skin, tightness in the chest, severe backache, dyspnoea, and cyanosis may be explained by the fact that the patient was anaesthetized during the transfusion of the first two bottles of blood. On the other hand, Mollison (1943) mentioned that reactions to incompatible transfusion seemed to be less severe than formerly, and Drummond (1944) describes a case of symptomless incompatible transfusion.

The presence of vast numbers of red blood cells and a few pus cells in the urine seemed to be in favour of a diagnosis of nephritis rather than of a haemolytic reaction. However, the presence of intact red blood cells in the urine is common, and white blood cells, often in clumps, are present during the oliguric period following an incompatible transfusion (Muirhead *et al.*, 1948). Pigment granules, often about the size and shape of a red blood corpuscle (for which they are not infrequently mistaken), are seen in haemoglobinuria (Bywaters and Dible, 1943).

2. The Severity of Renal Failure

In general, sensitization to the Rh antigen which occurs as a result of repeated transfusions develops slowly and early reactions are mild or inapparent (Mollison, 1948). In this case the reaction was severe after virtually the

second transfusion. The original transfusion of 5 pints of blood within 36 hours at the time of wounding can be regarded as a single antigenic stimulus. It is of comparative interest that Cappell (1948) has found that the first recorded manifestation of haemolytic disease of the newborn due to Rh incompatibility is usually one of the severer forms, contrary to the widely held belief that the first one or two affected children in a family show only mild symptoms.

Unfortunately, the volume of incompatible blood transfused in the case is not known with certainty, but the late Dr. Douglas Macrae, of the Edinburgh Blood Transfusion Service, informed us that at the time of the transfusion it was the practice to screen all Group O donors with a diagnostic anti-D serum, and, as it is certain that blood specifically marked Rh-negative was not given to this patient, the probability is that 1,600 ml. of incompatible Rh-positive blood was given. Bordley (1931) stated that cases receiving larger volumes of incompatible blood tend to be more serious—a conclusion with which Muirhead *et al.* (1948) are in general agreement. On the other hand, one of us (J. W.) has recently seen a Group O patient who had only a transient haemoglobinuria following a transfusion of 4 pints (2.27 litres) of Group A blood and did not develop renal failure. The anti-A titre of this Group O patient's serum four weeks after transfusion was 512,000. The probability is that several factors play a part in producing renal failure in such cases, the most important being renal anoxia (Maegraith *et al.*, 1945).

3. Compatibility Tests

The direct compatibility test in which the patient's serum is set up against saline suspensions of red cells will fail to detect the presence of blocking antibodies. To detect such antibodies the red cells must be suspended in AB plasma or preferably in 20% bovine albumin solution (Mourant, 1948). There is of course no proof that in this case blocking antibodies would have been detected in the patient's serum *before* transfusion. These antibodies may disappear after the original sensitization, but can be produced again very rapidly following the appropriate antigenic stimulus.

The two most important lessons to be learned from this case are : (i) always to determine the Rh blood group of *any* patient previously transfused, and (ii) the so-called compatibility test is not an absolute safeguard against incompatibility.

4. Survival of the Patient

Many forms of therapy have been advocated in the treatment of haemolytic transfusion reactions—e.g., alkaline therapy, forced fluids, transfusion of compatible blood, splanchnic block, and decapsulation of the kidney (Kilduffe and De Bakey, 1942)—but opinions differ on the value of these methods. Few observers are in a position to study a large controlled series of such cases, and this renders assessment of a particular form of therapy difficult. According to De Gowin (1938) some patients recover spontaneously, while others die in spite of the therapeutic measures advocated. The present case illustrates that even severely damaged kidneys may recover completely without any heroic therapy.

Summary

A severe degree of renal failure from which the patient subsequently made a complete recovery occurred after a blood transfusion.

The transfused blood appeared to be compatible when tested against the patient's serum.

On investigation the patient, who had been transfused previously as a war casualty, was found to be Rh-negative and to have rhesus antibodies of the incomplete, blocking, or albumin-agglutinating variety in his serum.

The importance of determining the Rh group in any patient previously transfused, and the danger of relying on the direct compatibility test only, are stressed.

The clinical features and treatment of haemolytic transfusion reactions are discussed.

We wish to thank Dr. W. M. McAlister, medical superintendent of Bangour Hospital, for permission to publish this case. We also acknowledge with thanks the help received from Dr. I. A. Purdie in the biochemical investigations and the helpful co-operation of Mr. A. B. Wallace, who was in charge of the case.

References

Bordley, J. (1931). *Arch. intern. Med.*, **47**, 288.
Bywaters,, E. G. L., and Dible, J. H. (1943). *J. Path. Bact.*, **55**, 7.
Callender, S. T., and Paykoç, Z. V. (1946). *British Medical Journal*, **1**, 119.
Cappell, D. F. (1948). Ibid., **2**, 323.
Coombs, R. R. A., Mourant, A. E., and Race, R. R. (1945). *Lancet*, **2**, 15.
De Gowin, E. L. (1938). *Ann. intern. Med.*, **2**, 1777.
Diamond, L. K. (1946). *Proceedings of International Haematol. and Rh Conference*, Dallas, Texas.
Drummond, R. (1944). *British Medical Journal*, **1**, 483.
Gunz, F. W. (1946). Ibid., **1**, 601.
Hattersley, P. G. (1947). *J. Lab. clin. Med.*, **32**, 423.
Kilduffe, R. A., and De Bakey, M. (1942). *The Blood Bank and the Technique and Therapeutics of Transfusions*. St. Louis.
Maegraith, B. G., Havard, R. E., and Parsons, D. S. (1945). *Lancet*, **2**, 293.
Mollison, P. L. (1943). *British Medical Journal*, **1**, 529.
—— (1948). Med. Res. Counc., Mem. No. 19, p. 27.
Mourant, A. E. (1948). Ibid., No. 19, p. 60.
Muirhead, E. E., Haley, A. E., Haberman, S., and Hill, J. M. (1948). *Blood*, Special Issue, No. 2, p. 101.
Race, R. R. (1944). *Nature*, **153**, 771.
Wiener, A. S. (1944). *Proc. Soc. exp. Biol., N.Y.*, **56**, 173.

DYSENTERY IN SOUTH PERSIA

BY

IAN S. STEWART, M.B., Ch.B.

Pathologist, Anglo-Iranian Oil Company

The control of this group of diseases, apart from the relief of the patients' discomfort, is of importance because they are productive of much time-wastage and inefficiency, matters of outstanding interest to a commercial concern. Moreover, the opportunity of identifying and segregating the patients who continue to be infective after apparent recovery will bring about a steady reduction in the incidence of the dysenteries in the province of Khuzistan, South Persia.

Accordingly arrangements were made in March, 1947, for all cases regarded as dysenteric, either on clinical grounds or from the initial examination of the stools in the laboratory, and arising among the company's 30,000 male artisan employees on Abadan Island, to be admitted to the Isolation Hospital, a segregated wing of which was allocated for this purpose. The project had been under consideration for two years but had been delayed by the restricted supplies of sulphaguanidine. The arrival of a hundredweight (50 kg.) of this drug in March was followed by the opening of a forty-bed ward on April 1, and the figures subsequently quoted relate to the admissions between April 1, 1947, and April 1, 1948.

The survey relates to a permanent and static civilian population and therefore has a value greater than that of a survey of the same diseases during the conditions of war, when large masses of population are moved into abnormal sites and situations. Apart from its local value it has a bearing on the steadily increasing flow of short-term visitors of all nationalities drawn to the Persian Gulf by its

growing commercial importance. A proportion of these visitors will no doubt develop intestinal disturbances after leaving the area, and the rarity of amoebiasis in this particular area, shown in Table I, makes it unlikely that this disease will need serious consideration.

TABLE I.—*Diagnosis*

Amoebic dysentery in which vegetative *E. histolytica* was the sole agent found	52
Cases failing to respond to sulphaguanidine and in which *E. histolytica* was found later	2
Cases failing to respond to sulphaguanidine and treated as amoebic dysentery without proof	1
Balantidial dysentery in which *Balantidium coli* was the sole agent found	13
Pure bacillary infections:	
B. dysenteriae Flexner	353
„ Schmitz	49
„ Sonne	97
„ Shiga	19
„ Boyd	22
Mixed dysentery:	
E. histolytica and Flexner	3
„ „ and Boyd	2
Balantidium coli and Flexner	2
„ „ and Sonne	2
Bacillary type cases with negative culture responding to sulphaguanidine	698
Admitted late without laboratory investigation and responding to sulphaguanidine	115
Total	1,430

Table I is devoted solely to the dysenteries, the irrelevant admissions having been excluded. Such diverse conditions as diverticulitis, carcinoma of the colon, constipation, the acute diarrhoea of aestivo-autumnal malaria, and many more have inevitably arrived in the ward from time to time and have been redirected to the appropriate departments.

Proved amoebic dysentery therefore accounted for only 3.8%, whereas proved bacillary infections accounted for 37.3%, and 56.6% were of bacillary type but unproved. Balantidial and mixed dysenteries account for the balance.

The following facts are in favour of the bacillary origin of the cases in which no pathogen was seen or isolated: (1) A clinical side-room with a competent technician has been in existence close to the dysentery ward for four months and all cases slow in responding to sulphaguanidine have been reviewed. In only one case has *Entamoeba histolytica* been found. (2) The frequent use of test purges in these cases without result. (3) The absence of Charcot-Leyden crystals, the mucoid nature of the stools, and the characteristics commonly found microscopically in cases of bacillary dysentery. (4) The headache, the fever, and a colic relieved completely by the passage of a stool.

TABLE II.—*Carriers**

Organism	Carriers	Total Recorded	Percentage of Total
B. dysenteriae Flexner	21	358	5·9
„ „ Sonne	8	99	8·1
„ „ Schmitz	2	49	4·1
„ „ Shiga	1	19	5·3
„ „ Boyd	3	24	12·5
Total	35	549	—

* The medium used was SS ("difco") desoxycholate citrate agar adjusted to pH 7.

Table II resulted from the following procedure: Each case was detained in hospital for two days after sulphaguanidine therapy had ceased, the next stool passed was cultured, and the patient was discharged without waiting for the result. Those cases found to be positive were readmitted and given a course of 100 g. of the drug; all cases were then found to be free of infection. Multiple cultures would no doubt have revealed even more carriers, but the retention of so many recovered patients for six or seven days would not only have given rise to great discontent among the patients but added a further volume of work to the laboratory and put extra pressure on bed accommodation.

Treatment

Amoebic Dysentery.—All cases were given 4 g. of sulphaguanidine four-hourly, including the night hours, to a total of 20 g. Emetine hydrochloride in a dose of 1 gr. (65 mg.) was given daily for ten days and was followed by a five-day course of 0.25 g. of quinoxyl by mouth three times a day, and a retention enema of 5 g. in 200 ml. of saline each evening. Seven of the 54 cases were readmitted with a relapse in the course of the year.

Bacillary Dysentery.—Sulphaguanidine, 4 g. four-hourly, was given day and night until the patients were afebrile and symptomless. Table III shows the quantities required.

TABLE III.—*Sulphaguanidine Dosage*

Group	20 g.	40 g.	60 g.	80 g.	100 g.	120 g.	140 g.	Total
Flexner	116	87	50	58	24	17	1	353
Sonne	43	28	8	16	2	—	—	97
Schmitz	15	17	8	7	2	—	—	49
Shiga	11	5	3	—	—	—	—	19
Boyd	15	5	1	1	—	—	—	22
Clinically bacillary	364	181	98	41	10	4	—	698
No lab. investigation	66	24	14	4	7	—	—	115
Total	630	347	182	127	45	21	1	1,353

Expressed in units of 20 g., the average requirement of each group is as follows: Flexner, 2.5; Sonne, 2; Schmitz, 2.3; Shiga, 1.6; Boyd, 1.7; clinical dysentery, 1.8; no investigation, 1.8.

Complications.—The only major complication worthy of record is acute hepatitis, which may or may not have been amoebic in origin, ten cases developing while in hospital. One of them was admitted with a Sonne infection and one with a Flexner. The remainder had negative stool cultures. In none had amoebae or cysts been seen in the stools, but all responded satisfactorily to emetine.

Mortality.—No death occurred in the series. Two individuals who were not employees died with bacillary dysentery as a terminal event, one being a case of advanced rheumatoid arthritis and the other an old man with prostatic hypertrophy and acute retention.

Summary

An organization for the control of dysentery in a large industrial population is described, the frequency of the different forms assessed, and an analysis made of the quantities of sulphaguanidine required in the different bacillary types.

Acknowledgments are due to Dr. S. D. McClean, chief medical officer, A.I.O.C., for inspiration and advice; to Dr. M. A. Khorram for his co-operation in the conduct of the ward; and to Lieutenant-Colonel H. J. Bensted, director of the Standards Laboratory, for the supply of diagnostic sera.

The Minister of Food has made the Mineral Oil in Food Order, 1949, which came into force on April 9, prohibiting the use of mineral oils in the manufacture of food for sale to the public. The Ministry states that for some time past the Ministries of Food and Health and the Department of Health for Scotland have been concerned both on medical and nutritional grounds about the growing practice of using paraffins in the preparation of food. The Ministry also urges housewives not to use these substances in home cooking. The statement says that deposits of medicinal paraffin would not, so far as is known, be harmful in themselves, but the same could not be said for other mineral oils, many of which are known to contain harmful substances. "Too little is known about the fate of deposits of mineral oils in such organs as the liver for the medical profession to remain indifferent about them." The risks of consuming liquid paraffin were discussed in a leading article in this *Journal* in 1948, June 12 (p. 1141). It concluded with these words: "On the evidence available, therefore, the use even of refined liquid paraffin (*B.P.*) in the preparation and cooking of food is to be condemned. . . . The internal use of other (unrefined) mineral oils in any shape or form must always be condemned."

FURTHER EXPERIENCES WITH ETHINYL OESTRADIOL IN THE SUPPRESSION OF LACTATION

BY

T. N. A. JEFFCOATE, M.D., F.R.C.S.Ed., F.R.C.O.G.

AND

BETTY HARGREAVES, M.B., Ch.B., M.R.C.O.G.

(From the Department of Obstetrics and Gynaecology, University of Liverpool)

In a previous communication (Jeffcoate *et al.*, 1948) it was mentioned that some writers had suggested that ethinyl oestradiol when administered orally has a more prolonged action than other oestrogens. To test the validity of this suggestion further clinical trials have been carried out, the suppression of lactation again being the test object. The total dose administered was of the same order as in the previous trials, but it was all given in one or two days instead of being spread over seven days. Single doses were impracticable, since it would have meant that a patient took a very large number of 0.05-mg. tablets at one time. In one scheme the total dose was given during one day and usually within twenty-four hours of delivery; in the second the same total dose was given, half during the first day and half during the fourth day of the puerperium. Thirty-seven patients were treated, and the results are classified as excellent, good, fair, or poor, according to the criteria set out previously.

Scheme I

(*a*) *Technique.*—Eleven tablets (0.55 mg.) during the first day, administered in three doses at four-hourly intervals. *Results:* Six patients were treated, two with excellent results. Two had fullness of the breasts with pain on the fourth and fifth days, one had free secretion of milk on the fourth and fifth days, and a sixth complained of fullness and pain on the sixth day. A supplementary course of treatment with 0.1 mg. of ethinyl oestradiol was necessary in these four cases. (Two excellent, four poor.)

(*b*) *Technique.*—Fifteen tablets (0.75 mg.) during one day, administered in three doses at four-hourly intervals. *Results:* Seven patients were treated, one with excellent result. Two experienced fullness of the breasts with slight discomfort—on the second day in one case and on the fourth day in the other. In the latter, treatment did not begin until the second day of the puerperium. Four patients showed a poor response. In two of these, symptoms arose on the sixth and seventh days and necessitated further treatment. The two others started treatment on the second day and had pain and fullness on the following day. (One excellent, two fair, four poor.)

(*c*) *Technique.*—Twenty tablets (1 mg.) during the first day, administered in four doses at four-hourly intervals. *Results:* Four patients were treated, one with excellent result. A second patient had pain and fullness on the fourth day, a third had similar symptoms on the eighth day, whilst a fourth had a free flow of milk from the sixth to twelfth days. (One excellent, three poor.)

Scheme II

(*a*) *Technique.*—Six tablets (0.3 mg.) first day, five tablets (0.25 mg.) fourth day—total, 11 tablets (0.55 mg.). *Results:* Six patients were treated, three with excellent results and two with good results. Of the latter, one had slight secretion on the fourth and the other on the fifth day. A sixth had minimal discomfort on the second day only. (Three excellent, two good, one fair.)

(*b*) *Technique.*—Eight tablets (0.4 mg.) first day, seven tablets (0.35 mg.) fourth day—total, 15 tablets (0.75 mg.). *Results:* Seven patients were treated, two with excellent results. Four cases had moderate fullness of the breasts on the fourth day, relieved by the second dose, whilst the seventh case had fullness and pain on the fourth day. (Two excellent, four fair, one poor.)

(*c*) *Technique.*—Ten tablets (0.5 mg.) first day, ten tablets (0.5 mg.) fourth day—total, 20 tablets (1 mg.). *Results:* Seven patients were treated, with excellent results in three cases and with a good result in another two. The remaining two cases had pain and fullness of the breasts—one on the fourth and the other on the sixth day. Both required further treatment. (Three excellent, two good, two poor.)

Conclusions

The results of these trials may be summarized by saying that ethinyl oestradiol in relatively large doses given over a short period or at long intervals is unreliable in suppressing lactation, whereas in divided doses spaced over several days it was previously shown to give excellent or good results in a high percentage of cases. With a total dose of 0.55 to 0.75 mg. given during the first seven days of the puerperium an excellent or good response was noted in 24 out of 27 cases in the previous trials. In this series, 0.55 mg. to 1 mg. administered during a period of 12 hours produced only four good or excellent results in 17 cases. When it was divided and given half on the first day and half on the fourth day of the puerperium the effect was satisfactory in 12 out of 20 cases.

The results reported here compare so unfavourably with the earlier ones that it seems permissible to conclude that they offer little evidence to support the idea that ethinyl oestradiol is absorbed or utilized comparatively slowly and that its effect is prolonged. If it has these properties, then they are not so strongly developed as to make the administration of single massive doses, or large doses at infrequent intervals, an efficient method. As in the case of other oestrogens, smaller doses given regularly during several days are the most effective.

REFERENCE

Jeffcoate, T. N. A., Hargreaves, Betty, Lister, Ursula M., and Roberts, H. (1948). *British Medical Journal*, **2**, 809.

METATARSUS QUINTUS VALGUS

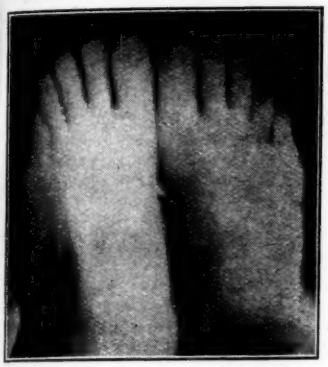
BY

HORACE DAVIES, Ch.M., M.Ch.Orth., F.R.C.S.

Orthopaedic Surgeon, St. Catherine's Hospital, Birkenhead, and Whiston Hospital, Lancs

Much individuality appears to exist in the shape of the fifth metatarso-phalangeal junction. Rarely do we see a foot with its outer border prolonged straight forward along the little toe. The head of the metatarsal interrupts this line by protruding outwards, and the axis of the little toe is usually directed inwards. Most feet therefore exhibit a bunionette, or, as it has been called, a tailor's bunion, to a greater or less degree. Rarely, however, does it give rise to symptoms. A bunionette is not uncommonly seen in combination with pes and hallux valgus and general splaying of the forefoot, and is therefore regarded as a secondary deformity in these cases. Chronic irritation due to pressure upon the lateral surface of the foot in the cross-legged or sartorial position is also to be considered as a causative factor, for it was this that gave rise to the name "tailor's bunion." The case of bilateral bunionette described below appeared as a primary and independent deformity, and the suggestion is made that such a condition can occur as a distinct clinical syndrome.

A girl aged 9 came to the clinic complaining of painful swellings at the bases of the little toes. They had been



noticed about two years previously, but had remained symptomless until the last six months. Examination revealed unusually prominent swellings over the fifth metatarso-phalangeal joints, with the little toe directed inwards, following the axial deviation of the outer three digits. Radiographs show a varus position of the little toe, adaptive changes in the basal phalangeal and metatarsal epiphyses, and outward splaying of the fifth metatarsal. Clinically and radiologically the condition therefore resembles metatarsus primus varus.

Aetiology

In considering the cause of this condition we must refer to the embryology of the foot. The mesodermal concentrations destined to be the metatarsals are laid down radially, diverging towards the convex border of the limb bud. This fanwise arrangement persists up to about the 20-mm. stage. At this time we see the differentiation and development of the transverse metatarsal ligament, and this restraining rein thrown across the heads of the developing metatarsals appears to exert a converging influence. Development proceeds with the metatarsals assuming the more parallel positions they occupy in the adult. Imperfect attachment of the transverse metatarsal ligament to the fifth metatarsal could allow primitive divergence to persist, which I would suggest is the primary error in this condition.

In the early stages the developing digits radiate from the convex border of the limb bud, following the lines of the diverging metatarsals, and their realignment to the adult position is difficult to explain. It would appear, however, that two factors are at work: (1) the inherent human pattern responsible for the blue-print of our shape and size, and (2) mechanical forces.

In considering these mechanical forces we see that the changing shape of the developing foot plays an important part. The convex border of the embryonic foot presents at first a large arc of a small circle. As development proceeds this arc expands, gradually transforming itself into a wider arc of a larger circle, with predominant expansion of the pre-axial side. This expansion of the arc brings the radiating toes into more parallel positions. Coinciding with this, the developing intrinsic and extrinsic muscles begin to exert their influence. The flexor longus digitorum, pulling from the inner margin of the foot, has an adducting effect upon the third, fourth, and fifth toes. This pull is exerted mainly upon the terminal phalanges. The toes are pulled into their parallel positions, but in many individuals this pull continues beyond the normal, and the terminal phalanges are adducted and flexed. The intrinsic muscles, especially the pedal interossei, should prevent this, as one of their little-appreciated functions is to extend the two terminal phalanges. There thus develops a minor tug-of-war between the strong adduction flexing action of the long flexor and the relatively weak degenerating interossei. Now if the primitive divergence of the fifth metatarsal persists the obliquity of the flexor pull is increased and the whole fifth digit becomes adducted.

Treatment.—Rarely do these cases require active treatment other than the provision of well-fitting shoes. Bunionectomy or trimming of the lateral surface of the metatarsal head may be necessary in pronounced cases with clinical symptoms. If the primary factor is the abduction of the metatarsal shaft, osteotomy should theoretically be the treatment of choice, but in practice, as for metatarsus primus varus, this procedure is both unnecessary and often unsatisfactory.

Summary

Unusual prominence at the fifth metatarso-phalangeal joint is either a primary or a secondary deformity. If it occurs as an independent condition it constitutes a syndrome, which should be described as metatarsus quintus valgus. The underlying basic congenital error is the persistence of the embryonic splaying of the fifth metatarsal, probably due to incomplete or imperfect development of the transverse metatarsal ligament.

Medical Memoranda

Sprue-like Mouth and Swelling of Lips as a Manifestation of Streptomycin Sensitivity

Many toxic manifestations of streptomycin have been described, but the following experience seems to add one more to the list of "dangers."

Case History

A man aged 57, a wine merchant of moderate habits, was recently seen by me for chronic pulmonary tuberculosis. There was infiltration of both lungs, with cavitation on the right, and it appeared from the history and from his subsequent response to conservative treatment that he was going downhill. It was therefore decided to try streptomycin. The streptomycin used was streptomycin calcium chloride complex, and the amount given was 1 g. daily in two doses. One month later the E.S.R. still remained high (95 mm. in one hour), but there was considerable subjective improvement. He, however, complained of some temporary giddiness following injections which did not amount to vertigo.

Five weeks after the beginning of treatment he complained of slight weakness of the legs, particularly noticeable on climbing stairs, and on the same day there was a feeling of numbness of the lips with a slight swelling of the mucous membranes. Within two days the patient complained of a feeling of thickness of the tongue, which subsequently became furred and after a few days ulcerated; at the same time there was some superficial ulceration of the inner aspects of the cheeks, the whole picture resembling severe sprue except that the lips were swollen.

Professor G. Ransome saw him at this stage and suggested that a vitamin-B deficiency factor might be contributory. Sensitivity was suspected in view of the lip-swelling. The streptomycin was stopped and the patient was given daily five 4-ml. injections of "plexan" and an adequate dosage of vitamin-B complex. The condition slowly subsided over a period of three weeks, during which time he experienced considerable pain.

Three weeks after stopping streptomycin it was decided to try a test dose to establish whether or not this was indeed a manifestation of streptomycin sensitivity. Three hours after injection of 0.5 g. the lips and tongue swelled, the pulse rate increased, and the patient felt warm all over and itchy. There was a migraine-like headache. Two mg. of adrenaline in oil was given and 50 mg. "benadryl" thrice daily, this being continued for a few days. The immediate distress was relieved within a few hours, but the swelling of the lips and

tongue remained for a week. The dorsum of the tongue again ulcerated and took a further fortnight to heal.

It seems clear, therefore, in view of the fact that fungous and bacillary infections were ruled out, that this was a surface necrosis of the mucous membrane of the tongue, cheek, and lips directly due to streptomycin.

A. W. S. THEVATHASAN,
L.M.S.Singapore.

Death from Lightning-stroke, with Multiple Injuries

Textbooks of forensic medicine are unanimous in stating that lightning-stroke may be accompanied by signs suggestive of great mechanical violence, but in actual practice gross injuries other than burns seem to be comparatively uncommon. Peterson, Haines, and Webster (1923) state that Schneider was among the first to record the fact that bones may be broken and blood vessels ruptured; while Rhodes, Gordon, and Turner (1945) say that the lesions vary in extent and nature and usually take the forms of burns of different degree, but that deep-tissue destruction with fractures of the bone occurs in certain cases.

Dixon Mann (1922) quotes a case in which there was a compound fracture of the right tibia and a comminuted fracture of the os calcis; there were also extensive burns. He goes on to say that fractures of the bones, including those of the skull, have occurred, but only exceptionally. Lyon (1935), quoting Tidy, states that fractures are rare but have been found in a few cases. Glaister (1945) describes a case of fractured base and in another a compound fracture of the tibia.

Taylor (1948), Sydney Smith (1940), Keith Simpson (1947), and other authorities make similar statements, but I have not been able to find a published case exhibiting the degree of injury shown in the accompanying photograph.

CASE HISTORY

On March 22, 1948, at half-past six in the morning, there was a sudden sharp thunderstorm accompanied by heavy rain. As is common in this part of the world, the electrical manifestations of the storm may be limited to one or two vivid flashes accompanied by heavy crashes of thunder, and in this particular instance the only significant flash was responsible for this one fatality.

I accompanied the police officer to a small native hut in which the occupant had been killed. The hut, consisting of a single room, was constructed of sticks and mud with a low thatched roof. The walls and thatch were dilapidated, but there was little evidence of recent damage. About 9 in. (22.8 cm.) from the rear wall there was a coconut tree, which showed signs of the effects of recent lightning. The top was damaged and at intervals down the trunk the bark had been torn off. In fact, the tree-trunk had the appearance of having been clawed by a giant animal.

There had been two occupants of the hut—the dead man and his elder brother, the latter sleeping in a bed and the former on a rush mat adjacent to the wall nearest to the coconut tree, and within a foot of the bed. There was no direct evidence about the patient's position at the time of the fatal flash. The surviving occupant stated that his brother left the hut at daybreak to go to the latrine and returned about two minutes before the flash. The survivor was practically unhurt, but was somewhat dazed and unable to give any account of the accident. He was unaware whether his brother had been standing, sitting, or lying down at the actual moment.

The body was found lying at full length on the remains of the sleeping-mat with the head resting on a folded fez cap. The mat itself appeared to have been blown to pieces: some fragments were found adhering to the under surface of the thatched roof. The body was naked, and it is of some interest to know that it was occupying exactly the same position and adopting the same attitude as would have been the case had death occurred in sleep and if the shock had not disturbed the body to the slightest degree. The surviving brother and other villagers were quite definite that no one had touched the body after death. This is probably true because, besides the native's reluctance to touch a body slain in this manner, he would never consider the corpse's comfort to the extent of folding a cap and placing it beneath the head. It is suggested, therefore, that all the injuries were due solely to the blasting action of the lightning, and it would seem that the man, having returned to his hut, had lain down on his mat again and made himself comfortable pending the ending of the storm.

The injuries are well illustrated in the photograph. On the left side of the neck all the soft tissues between the trachea and cervical vertebrae had been blown out, leaving a gap in which a closed fist could be placed. The wound on the left shoulder involved the whole of the deltoid region and showed a double fracture of the humerus, one at the neck of the bone and the other 4 in. (10 cm.) lower down the shaft. The separated portion of bone was lying free in the wound completely denuded of muscle. There were scattered superficial wounds and abrasions of the face and chest, and the right side of the abdomen was slate-grey in colour, the skin being dry and parchment-like. No actual burning or singeing could be seen. Superficial wounds in the pubic region involved the penis and scrotum, and on the inner sides of both thighs deep lacerated wounds extended from the groins to within 2 in. (5 cm.) of the knees. There was a lacerated wound of the right big toe, with smaller wounds on the dorsum of the foot.

The scalp was uninjured, but a fracture of the left side of the frontal bone proceeded outwards and downwards to the base and a fracture of the right parietal bone passed backwards over the occipital bone to the foramen magnum. The base of the skull was shattered by multiple fractures, with displacement of the fragments. The brain showed no macroscopic signs of injury.

D. A. SKAN, M.B.E., M.B., B.S., D.T.M.&H.,
Senior Pathologist, Tanganyika Territory.

REFERENCES

Glaister, J. (1945). *Medical Jurisprudence and Toxicology*. Edinburgh.
Lyon, I. B. (1935). *Medical Jurisprudence for India*. Calcutta.
Mann, J. Dixon (1922). *Forensic Medicine and Toxicology*. London.
Peterson, F., Haines, W. S., and Webster, R. W. (1923). *Legal Medicine and Toxicology*. Philadelphia.
Rhodes, W. F., Gordon, I., and Turner, R. (1945). *Medical Jurisprudence (S. Africa)*. Capetown.
Simpson, Keith (1947). *Forensic Medicine*. London.
Smith, Sydney (1940). Ibid.
Taylor's *Principles and Practice of Medical Jurisprudence* (1948). Ed. by S. Smith. London.

The Ministry of Health and the motor industry have agreed on a scheme for speeding delivery of cars urgently required by domiciliary midwives. A midwife who already has a car must produce evidence that it is not reliable. Local supervising authorities will certify the urgent need for a car. Similar certificates must be obtained from nursing associations or hospitals who have ordered cars for domiciliary midwives. The scheme does not apply to home nurses who do not undertake midwifery or to health visitors.

Reviews

HOSPITAL ADMINISTRATION

A Study of Hospital Administration. Studies in Public Administration. By Frank Hart and A. J. Waldegrave. (Pp. 188. 15s.) London: Stevens and Sons. 1948.

The growth of hospitals in Britain has been extraordinarily haphazard and comparatively unrelated to the overall needs of the local community. Consequently administration throughout the hospital field is very variable, and a complete description of the variations is almost impossible within the limits of a somewhat brief study. However, those interested will find an up-to-date account of methods of administration in the general, voluntary, and local authority hospitals as they existed until July 5, 1948. The efficiency of members of regional boards and hospital management committees would be much increased if each possessed the knowledge contained within these pages; perhaps the Minister of Health may see fit to present a copy to each member.

The authors discuss at length the vexed question of lay and medical administration, and the point of view which they express has a slight bias towards a lay head. Unfortunately, though the power of the medical staff is effectively safeguarded, they put forward no practical solution for meeting the medical needs of the local community, particularly in respect of difficult subacute and chronic cases. They emphasize the importance of medical staff committees, but though they give an excellent account of present nursing administration they do not suggest that nursing committees should be established in each hospital with powers equivalent to those held by their medical colleagues. They show that some hospital departments lack up-to-date business methods, particularly in relation to management of the staff and the facilities provided for them. If these defects were remedied, hospitals would not find the same difficulties in recruiting staff as they do to-day.

The chapter on planning gives some pointers to the future and refers the reader to several excellent reports on which such planning should be based. Here the great shortage of beds is emphasized, while elsewhere the authors frankly face the problem of insufficient nurses. This book can be highly recommended for the facts it contains, and we trust these will stimulate those who read to formulate a constructive hospital policy.

HORACE JOULES.

MANUAL OF DISSECTION

Ellis's Anatomy. Being a Manual of Dissection and Textbook of Regional Anatomy. Revised and edited by J. A. Keen, M.B., F.R.C.S. (Pp. 487. Illustrated by 216 of the original engravings, of which 79 are in colour. £2 2s.) Capetown: Stewart Printing Co. (Pty.), Ltd. London: John Murray. 1946.

This ancient manual of dissection by George Viner Ellis (1812–1900) was first published in 1840. Ellis occupied the chair of anatomy at University College from 1850 to 1877. Keen, through some inexplicable lapse, states in the preface to this new edition that "Professor Ellis, the original author of this book, was Emeritus Professor of Anatomy in University College, London, from 1850 to 1877, and thus an interesting link with the past is maintained." Ellis was professor at U.C.L. from 1850 to 1877, and lived in seclusion as professor emeritus to the end of the century. Even anatomists cannot look forward to half a century on the shelf.

Ellis was succeeded in the chair by Sir George Dancer Thane, who held it until 1919. Ellis had edited the 6th edition of *Quain's Anatomy* with William Sharpey, the dominating professor of physiology. Ellis's *Manual of Dissection* reached its high-water mark in its 10th edition by Thane in 1887. Keen states that all the important figures are based on the *Illustrations of Dissections* published by Ellis and G. H. Ford in 1867. Anyone acquainted with Thane's work in the 9th and 10th edition of the Quain would recognize the number of illustrations by his hand in the 10th edition of the Ellis—e.g., that of the brachial plexus (Fig. 5).

Thane steadfastly objected to splashes of colour as a means of showing the origins and insertions of muscle on badly executed drawings of bones. Addison, who re-edited the Ellis in its 12th edition in 1905, introduced these vulgarisms. All their inaccuracies have been maintained. The vastus intermedius (Figs. 47 and 48) is shown arising from the whole of the shaft of the femur, with no trace of the bare area. Examples could be multiplied. The section on the autonomic system is unintelligible and contains such phrases as, "The nerve cell of the 2nd neurone is often called the cell station," and, "The second neurone is the nerve cell in a ganglion and its axon, the fibres being non-medullated." The marginal or shoulder index which was so valuable a feature of the 10th edition by Thane has been deleted. Small paragraphs of doubtful value have been added in various places under the heading "Applied Anatomy." There is no mention of radiological anatomy.

It is sad to think that Thane's 10th edition of the Ellis and the 10th edition of the Quain (1896) by Thane and Sharpey Schäfer mark the high water of the tide of British anatomy. This present edition by Keen is a sad ebb from Thane's purpose—"to maintain the efficiency of the work as a guide to the acquisition of knowledge by practical study." Thane was the last of the precisionists. We are now in the hands of the confusionists.

H. A. HARRIS.

CHILD GUIDANCE

Psychotherapy in Child Guidance. By Gordon Hamilton (Pp. 340. $4.00 or 22s.) Columbia: University Press. London: Geoffrey Cumberlege (Oxford University Press). 1947.

In this book the author describes the methods and practice of the children's department of the Jewish Board of Guardians in New York. It is perhaps an unusual book in that it is written by a social worker and that in this clinic the social workers do the treatment in close collaboration with a psychiatrist. Since so many problems of behaviour in children are predominantly social, this is not illogical so long as the collaboration is really close, for the personal make-up of the child and his environmental situation are so closely blended. The treatment here described is eclectic and may be adapted to each individual problem. Although psycho-analytic theory is conspicuous in the book, the author does not consider that psychotherapy is synonymous with psycho-analysis or that it need be confined to medical methods. The psychiatrist, in fact, is regarded as a teacher and consultant rather than a direct therapist.

The author recognizes that in every case it is necessary to meet elemental social needs but that affect hunger may be as important as physical hunger. Both psychological and physical distresses are arcs of the same circle. The child is a growing organism and therefore adaptable, but both the social setting and the child's personality, which will always interact, may need adjustment. It should be remembered that a child's aggressiveness is always retaliation which to him seems justified. Many children have little experience of love, and so love is not worth seeking; the child feels that he must look after himself first. It is no use telling such a child to be good for a change; he and his circumstances must be changed if he is to be good. The anxious child is a neurotic child who uses his energy to repress infantile wishes. The resolution of such a conflict both increases energy and diminishes anxiety. Fortunately such a child wants to be helped and does not resist assistance. Severely disturbed children such as mental defectives and psychopaths are not very amenable to psychotherapy, but social adjustment may do much good. In direct treatment transference, catharsis, and relief through play are important, but social modification is generally necessary as well, and change of environment may alone restore the integrity of the personality.

Young children have many emotional vicissitudes to face, and they may react to them by disturbed behaviour, which in turn upsets the parents, so that a vicious circle is set up. Therapy must get beneath the aggressive and guilt reactions to the fundamental attitude, which is always that of a disappointed child. This is best done by play, because it is the little child's medium of communication and because it provides in a safe and natural way some of the instinctual gratification needed as he learns to meet the demands of reality. At the same time the parents, especially the mother, who are themselves neurotic need guidance and treatment. In older children the situation is more complex and can best be treated by transference,

interpretation, and verbalization, and again by increasing the understanding of the parents. In adolescence the strength of the urges and repressions is increased and the young person has at this stage to make entirely new adjustments to life. A strong, carefully managed transference is the best form of treatment so that the patient can be brought to understand and interpret his own difficulties.

In dealing with the family the social worker has to realize the complexity of the situation, for the parent is often projecting his own guilt or aggression or desire for punishment on to the child, and so the entanglement becomes very difficult to unravel. She has to establish transference with the whole family and so allow them to work out their difficulties and re-establish an integrated whole. To do this the social worker needs a long and elaborate training under expert psychiatric guidance, and she will of course learn both the social and psychological aspects of her task while undertaking the case work.

This is an interesting account of a successful venture in the care of difficult and delinquent children by methods rather different from those usually used in Britain. It is therefore worthy of the most careful study by those interested in the subject.

R. G. GORDON.

GLOMERULAR NEPHRITIS

Glomerular Nephritis: Diagnosis and Treatment. By Thomas Addis, M.D., F.R.C.P.Ed. (Pp. 338. £2.) New York and London: The Macmillan Company. 1948.

The impression which this book leaves with the reader is almost that of an autobiography, the summing up of one who has spent most of his life in the study of renal disease. Addis, we feel, is a man with a message who wants to give the medical world this record of his teaching and research. If the book is not wholly satisfactory it is perhaps because it tries to combine the two, while its autobiographic style is too discursive for either. Parts of the book are didactic and dogmatic, others strictly scientific and experimental; others again are practically in narrative form—as for instance the description of the life and death of a nephritic patient, which almost brings tears to the eyes. In spite of these defects—or should we say peculiarities?—Addis of course speaks with great authority and has much to say.

The chief subjects which he discusses are his rapid methods of biochemical and microscopical examination, specially designed to be suitable for use in an out-patient clinic, to give immediate answers to questions of prognosis and treatment; a description of the experiments which have been made by his team on the effects of removal of renal tissue in animals, and the inferences which can be drawn from this work; and a plea for low protein intake in the treatment of renal insufficiency. In America pendulums probably swing further than they do in this country, and it is evident that in many clinics all cases of renal disease irrespective of their clinical state have been given high protein diets. Addis, we think, brings conclusive evidence based on animal experiment to show that this is wrong, and that many cases of renal failure can be improved and kept leading useful lives for a long time on a suitably restricted protein intake. Most recent authors both here and abroad share this view. We found the experimental sections most interesting; there is information here which is difficult to find in convenient form elsewhere. Although, as we have observed, the book is not wholly successful either as a text-book or as a record of research, it must be read by all serious students of renal disease.

ROBERT PLATT.

The *Practitioner's Card-Index Guide to Treatment* is an ingenious file of notes on modern medical treatment of interest to the busy practitioner published by Devereaux (Medical) Publications Ltd., of 36, Maiden Lane, London, W.C.2 (5 guineas). The notes are filed on strong cards contained in a box, and the information is kept up to date by new cards distributed quarterly. The initial cost includes a year's replacement of cards; subsequently the cost of the replacement service is two guineas a year. The cards are arranged alphabetically and show the references in the literature to the treatment described.

BOOKS RECEIVED

[*Review is not precluded by notice here of books recently received*]

Encyclopedia of Medical Sources. By E. C. Kelly, M.D., F.A.C.S. (Pp. 476. 41s.) London: Baillière, Tindall and Cox. 1948.

A collection of references to medical eponyms and original reports.

Bright's Disease. By H. A. Christian, A.M., M.D., LL.D., Sc.D., M.A.C.P., Hon.F.R.C.P.(Can.), D.S.M. (Pp. 327. 45s.) London: Geoffrey Cumberlege. 1948.

Reprinted from *Oxford Loose-Leaf Medicine*

An Atlas of Bone-Marrow Pathology. By M. C. G. Israëls, M.Sc., M.D., M.R.C.P. (Pp. 79. 30s.) London: Heinemann. 1948.

An illustrated account of the marrow in health and disease.

Detailed Atlas of the Head and Neck. By R. C. Truex, M.S., Ph.D., and C. E. Kellner. (Pp. 162. 75s.) London: Geoffrey Cumberlege. 1948.

Anatomical illustrations.

The Family and Democratic Society. By J. K. Folsom. (Pp. 755. 30s.) London: Routledge and Kegan Paul. 1948.

A comprehensive study of family life in the modern democracy.

Rational Medicine. By J. W. Todd, M.D., M.R.C.P. (Pp. 378. 25s.) London: Simpkin Marshall. 1949.

Medicine regarded from an original approach.

A Short Practice of Surgery. By H. Bailey, F.R.C.S., F.A.C.S., F.I.C.S., F.R.S.Ed., and R. J. McNeill Love, M.S., F.R.C.S., F.A.C.S., F.I.C.S. 8th ed. Part 4. (Pp. 179. 52s. 6d. for five parts, not sold separately.) London: H. K. Lewis. 1949.

Part 4 deals with the surgery of the head, spine, peripheral nerves, breast, thorax, larynx, and hand.

Health Instruction Yearbook 1948. By O. E. Byrd, Ed.D., M.D. (Pp. 320. 20s.) London: Geoffrey Cumberlege. 1948.

Information collected from health articles published in the last year.

A Guide to Pacific Island Dietaries. Edited by J. C. R. Buchanan, M.D., F.R.C.P.Ed., D.T.M.&H. (Pp. 75. No price.) Suva, Fiji: Pacific Board of Health. 1947.

A handbook for dietitians and doctors of the South Pacific.

Roentgen Studies of the Lungs and Heart. By N. Westermark, M.D. (Pp. 216. 35s.) London: Geoffrey Cumberlege. 1948.

A fully illustrated account.

Manual of Clinical Laboratory Methods. By O. E. Hepler, Ph.D., M.D. 4th ed. (Pp. 387. 45s.) Oxford: Blackwell Scientific Publications. 1949.

A book of reference for laboratory and clinical workers.

The Invert and His Social Adjustment. By Anomaly. 2nd ed. (Pp. 290. 8s. 6d.) London: Baillière, Tindall and Cox. 1948.

An enlarged and revised edition of a book first published in 1927.

Demonstrations of Physical Signs in Clinical Surgery (Part IV). By H. Bailey, F.R.C.S., F.A.C.S., F.I.C.S., F.R.S.Ed. 11th ed. (Pp. 121. 8s. 6d.) London: Simpkin Marshall. 1949.

The fourth part of this well-known book for students.

An Introduction to Clinical Orbitonometry. By A. C. Copper, M.D. (Pp. 125. Paper 11s. 6d., cloth 14s. 6d.) Leiden: H. E. Stenfert. 1948.

English translation from the Dutch.

Experimental Immunochemistry. By E. A. Kabat, Ph.D., and M. M. Mayer, Ph.D. (Pp. 567. 45s.) Oxford: Blackwell Scientific Publications. 1949.

Deals mainly with laboratory technique.

The Renal Origin of Hypertension. By H. Goldblatt, M.D., C.M. (Pp. 126. 15s.) Oxford: Blackwell Scientific Publications. 1949.

A short monograph.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY APRIL 16 1949

NATURAL CHILDBIRTH

At a time when the topic of analgesia in labour has aroused not only public interest but political feeling, a recent address by Dr. Grantly Dick Read, the substance of which appears in our columns this week, serves as a reminder that there is another approach to the pains and discomforts of childbirth. Dr. Read has pertinaciously and with enthusiasm advocated for over fifteen years the case for "natural childbirth," and though many obstetricians would deny to his thesis the importance which he himself accords it he has not lacked adherents and followers on both sides of the Atlantic; and a recent report[1 2] on his methods from the Yale University School of Medicine supports his contention that normal labour, by which is implied a vertex presentation with the occiput anterior and no mechanical obstacle, should be virtually painless.

The basic argument is that fear, conscious or subconscious, causes a sympatheticotonia which shows itself locally as a resistant lower segment and cervix. This, he says, is because the circular inhibitory fibres of the cervical "sphincter," which are innervated by the sympathetic and which should be relaxed when the longitudinal fibres of the upper segment exert their detrusor action, are thereby stimulated to chronic contraction. In turn the longitudinal fibres in an effort to overcome the obstacle increase their tension, and thus the threshold of pain is overstepped. "A tense woman means a tense cervix and a tense cervix means a prolonged and painful labour."

Not everyone will agree that this argument is scientifically correct on anatomical and physiological grounds, but its advocates claim that it can be accepted because in practice the results are successful. It is admitted, however, that the application of the principles cannot be universal, because there is a small proportion of women who are "unteachable." In brief, instead of the more commonly employed method of breaking the fear–tension–pain sequence by analgesic and anaesthetic drugs in labour, the cycle is interrupted at the first stage of fear by antenatal education. This is not an entirely new doctrine. In 1932 Fairbairn[3] wrote: "The presentation to the woman's mind of childbirth as a natural process must be a guiding principle throughout all talks and examinations. Many women approach pregnancy and labour with a view distorted by what they have heard or seen of the terrors of labour. These difficult cases require careful consideration from the psychological side and will benefit by confidential talks in which may be revealed hidden dreads that might interfere with normal function." And in fact, after a phase in antenatal obstetrics in which the attendant was unduly preoccupied with the recognition of mechanical difficulties and the early detection of abnormalities, it is now true to say that there is more emphasis on the normal, on the teaching of techniques of relaxation, on the explanation of the mechanism of labour, and on how best to aid the natural forces. Obstetrics, as Dr. Read says, is the understanding of the mind as well as the body of the pregnant woman. In labour his practice—based on the recognition of the successive emotional phases—is to keep the patient informed of her progress, to ensure that she is not left alone without either doctor or nurse trained in these methods, and to reinforce the previously taught techniques of relaxation at the crucial times.

The advantages which are claimed for natural childbirth lie in the increased proportion of spontaneous labours in which the risks of anaesthesia and analgesia are avoided, and in the psychological satisfaction which the sense of achievement brings to the mother and indirectly to the baby. Natural childbirth is based primarily on an intimate doctor–patient relationship. And in this lies both advantage and disadvantage, for the personality of the individual doctor must be a very potent factor in the assurance of success, and unless the doctor is present during most of the labour many patients will lose control and experience pain. It is unfortunate that the present combination of district antenatal clinics with institutional delivery largely precludes the same doctor supervising both pregnancy and labour, and these and other practical difficulties are well illustrated by the disappointing results obtained by Rodway[4] in a controlled experiment on the value of antenatal exercises. The general-practitioner obstetrician has the greatest opportunity for putting these principles into practice and assessing their value.

As with all doctrines, Dr. Read's argument and practice will have adherents but will not lack detractors. Many of his principles, especially his emphasis on the effect of the emotional factor on the course of labour, are universally accepted, though the exact mechanism may be debated; and, if some consider that he has oversimplified the problem and been too optimistic about its solution, others will be encouraged to take up a more personal form of obstetric practice which alone will achieve results satisfying to both doctor and patient.

[1] Goodrich, F. W., and Thoms, H., *Amer. J. Obstet. Gynec.*, 1948, **56**, 875.
[2] Thoms, H., *J. Obstet. Gynaec. Brit. Emp.*, 1949, **56**, 18.
[3] *Practitioner*, 1932, **129**, 313.
[4] *J. Obstet. Gynaec. Brit. Emp.*, 1947, **54**, 77.

DUE CARE AND SKILL

Mr. John Hunter's successful appeal against Mr. Justice Birkett's judgment awarding an ex-patient £6,300 against him for negligence raises again the perennial question of what in law constitutes negligent diagnosis or treatment. We have already published full accounts of the proceedings at first instance[1] and on appeal.[2] Briefly, Mr. J. F. Whiteford, an American consulting engineer of about 65, was in the care of Dr. S. R. Gleed, a general practitioner of Finchley, who called in Mr. Hunter. He drained the patient's bladder suprapubically on March 22, and operated on April 5, 1942. He found in the base of the bladder an indurated mass which, after he had inspected and handled it for a quarter of an hour or twenty minutes,

he decided was an inoperable cancer. Subsequently Mr. Hunter informed the patient that he had not long to live. Mr. Whiteford then returned to the United States to put his affairs in order. In September he was seen by a New York urologist, Dr. B. S. Barringer, of the Memorial Hospital, and Mr. Hunter's diagnosis was proved wrong by biopsy and also by the survival of the patient. Mr. Whiteford returned to England and sued Mr. Hunter and Dr. Gleed for negligence. The judgment against Mr. Hunter was given in July, 1948, the action against Dr. Gleed being dismissed. At the recent appeal the judgment was reversed, and leave was given to Mr. Whiteford to appeal to the House of Lords. As the case is still *sub judice*, it would not be proper to comment in such a way as to prejudge the issue, but it is permissible to inquire what that issue is, and to examine the approach to it made by the trial judge and by the Court of Appeal.

The question which the courts had to decide was not whether Mr. Hunter's diagnosis was wrong—that was admitted. The issue before them was whether, on the evidence, Mr. Hunter had failed to use the skill and care which could reasonably be expected of a practitioner in his position. The standard expected of such a well-known senior consulting surgeon is a very high one, but it still does not require him to be infallible. It was pointed out in the Manchester swab case,[3] just before the war, that "it is not every slip or mistake which imports negligence, and in applying the duty of care to the case of a surgeon it is peculiarly necessary to have regard to the different kinds of circumstances that may present themselves for urgent attention." Accordingly the courts had to consider the standing of Mr. Hunter, the skill which he offered to the public, the quality of the services which a patient had a right to expect of him, and then, so far as possible putting themselves in his place and visualizing the situation in which he found himself, they had to judge whether on a reasonable view he did all that could have been expected of him in that situation. The trial judge found that he did not, and the Court of Appeal found that he did, use reasonable skill and care in the circumstances.

The issue was in fact narrowed down to two questions: Should Mr. Hunter have used a cystoscope? and, Should he have performed a biopsy? There was no dispute that clinically the submucous inflammatory condition from which the patient was suffering may be practically indistinguishable from cancer. In his own evidence Mr. Hunter said that he did not habitually use a cystoscope in cases of acute retention. At the operation itself there would have been no point in using it, as he was about to see the interior of the bladder directly. When asked why he did not take a specimen for biopsy, he replied that he had deliberately decided not to do so for three reasons. He would probably have had to cut so deeply that there would be a risk of perforation of the bladder wall; the biopsy incision would have, in the case of cancer, left an unhealing ulcer which would have added greatly to the misery of the patient's last days; and, thirdly, even if the pathologist had given a negative report he would still not have been satisfied, for he would have suspected that he had not taken the specimen from the right part of the lesion. Expert witnesses supported Mr. Hunter.

Apart from the cross-examination, the only medical evidence for the patient was that of Dr. Barringer. This had to be taken in New York on commission, a process which is open to obvious and inevitable disadvantages. Counsel for both sides pose questions in examination and cross-examination as in court, but the evidence suffers from being taken outside its proper context in the trial, and nearly always lacks answers to essential questions which probably would have occurred to counsel and to the judge if the witness had been present in the ordinary way. Dr. Barringer's evidence suffered from these disadvantages, and this trial is to that extent prevented from being a clear-cut object lesson in the law of medical negligence. The chief difference between the trial judge and the Court of Appeal was in their respective assessment of the evidence taken on commission as it appeared in the official record. Mr. Justice Birkett laid great stress on Dr. Barringer's statement that the diagnosis should have been verified by a complete examination with the cystoscope and through the open bladder, with a pathological examination of any questionable areas. He accepted this statement against Mr. Hunter's reasoning, and accordingly held the mistaken diagnosis to have resulted from lack of reasonable care, particularly in not using the cystoscope and in not undertaking a biopsy.

The Court of Appeal, on the contrary, could not support the trial judge's finding that the cystoscope should have been used on April 5, when the inside of the bladder was going to be observed by direct touch and sight, and regretted that this point had not been put more clearly to Dr. Barringer by counsel in New York. Their Lordships said, too, that, far from being clear and unambiguous, as Mr. Justice Birkett described some of Dr. Barringer's evidence, it contained many ambiguities, and they pointed out several omissions of points with which they wished counsel in New York could have dealt. They felt that in several respects Dr. Barringer had been directing his attention, not to the condition which Mr. Hunter had had to deal with, but to the very different condition which Dr. Barringer himself had found several months later. They therefore held that the trial judge should not have accorded such decisive importance to Dr. Barringer's evidence, and they could not support his finding that Mr. Hunter had been negligent in not carrying out a cystoscopy and a biopsy.

The circumstance that the chief evidence for the patient had to be taken on commission has another bearing apart from the quality of that evidence. Normally an appellate court, not having heard the witnesses nor observed their demeanour under examination and cross-examination, will not readily differ from the trial judge on his assessment of the value of their evidence. In the present case, as the trial judge did not see this important witness nor have the opportunity of questioning him, the Court of Appeal could feel itself just as well able as the trial judge to examine the record of his evidence and to assess its value. The two courts differed fundamentally over the interpretation of that record, and if the case goes

[1] *British Medical Journal*, 1948, 2, 537.
[2] Ibid., 1949, 1, 595.
[3] *Mahon and Osborne* (1939 2 K.B. at p. 14).

to the House of Lords judgment will doubtless be brought to bear upon it afresh. Upon that judgment the ultimate result of the case is bound in large measure to depend.

THE BUDGET AND HEALTH

The cost of the social services was the recurrent theme in Sir Stafford Cripps's Budget speech. He rebuked those who, while demanding costly social services, at the same time asked for reduction of taxation. "Last year," he said, "the people of this country enjoyed an unexampled national dividend in the form of a free National Health Service at the cost for nine months of its duration of £208 million. Next year, for 12 months, it is estimated to cost £268 million." The education and health services in England and Wales and Scotland, national insurance, and national assistance would provide benefits amounting to £763 million. This, the Chancellor said, must be reckoned as a real saving to the individual. "But the cost in 1949 was not the end." At present 60,000 hospital beds were out of use because of want of staff; to make them available once more would cost £15–£20 million. These services had to be paid for out of direct and indirect taxation. He gave the warning, however, that the speed at which the social services expanded must be moderated in accordance with "our progressive ability to pay for them by an increase in our national income."

The N.H.S. is an important part of what the Chancellor called "a permanent and continuing obligation which automatically increased as those services inevitably developed." Seeing, and perhaps fearing, this automatic and inevitable increase, he hinted that next year he might have to impose "some special charge or tax in connexion with the health services . . . this might help to make people more economical in their use of the services." In discussing the supplementary estimate in the *Journal* of Feb. 19 this year we wrote: "The Government may yet consider it wise to ask the patient to make token payments for a doctor's services and for prescriptions. If this were considered feasible it would deter people from making unwarranted calls upon the doctor's time and unnecessary demands for pills and potions." With increasing control of infectious diseases—witness the slackening of work in the fever hospitals as a result of the diminution of diphtheria—and the promotion of health, the increase of medical services should not need to be "automatic" and "inevitable." Automatic and inevitable increase is more likely to occur in the administration of the services; establishments grow like coral reefs. The medical profession will want to keep a sharp eye on the size and cost of the administrative machine. To take two items—how many thousands of pounds will be spent in one year to enable the Spens Awards Committee to distribute its prizes? How many valuable medical man-hours will be spent unprofitably in interminable committee meetings?

Sir Stafford Cripps made one comment in his broadcast on April 6 which seemed to imply that the present Government had contributed to the fall in infant mortality. "And these improved social services—the better care of our children in particular—have," he said, "had remarkable results. Do you know that infant mortality is now less than two-thirds of what it was ten years ago? . . . We have very deliberately chosen this most sure way of increasing the health and happiness of our people. . . ." Can Sir Stafford Cripps really be ignorant of the fact that the infant mortality curve has fallen steadily and evenly for the past fifty years,[1] years in which Labour Governments have been conspicuous by their absence. He might just as well, and with equal relevance, have attributed "to these improved social services" the increase in juvenile delinquency.

[1] Martin, W. J., *British Medical Journal*, 1949, **1**, 438.

LIGATION OF THE INFERIOR VENA CAVA

Ligation of the inferior vena cava is a certain method of preventing pulmonary embolism in all but a few cases, since more than 95% of such emboli come from the lower limbs and the majority of other emboli arise in the pelvic veins. Thebaut and Ward[1] have reported a series of 36 cases of ligation of the inferior vena cava and recommend this as the treatment of choice in patients with thrombo-embolism. While many would not entirely agree with this recommendation there can be no doubt that in selected cases ligation of the inferior vena cava is a valuable operation. The four deaths in Thebaut and Ward's series were in advanced cases in which the operation was undertaken too late, and two of their patients died at operation before the vena cava had been tied.

For those who rely solely on the anticoagulant drugs or on vein interruption at lower levels ligation of the inferior vena cava may seem an unduly radical method of treatment. Ligation of the superficial femoral and of the common femoral veins is, however, followed by embolism in a small proportion of cases, these emboli arising either from the deep femoral veins, the pelvic veins, or from the ligated veins at a higher level. Theoretically a strong case can be made out for ligation at the highest possible level, but against this must be set the undoubted risks of the operation in some of those cases in which the indications for it are strongest. Ligation of the inferior vena cava just above its origin is technically no more difficult than an extraperitoneal lumbar ganglionectomy on the right side and, as in that operation, is most easily accomplished through a transverse incision at the level of the umbilicus. The intraperitoneal operation is more difficult and dangerous, and it should be reserved for those cases in which the vena cava is ligated in the course of some other abdominal operation.

Swelling of the legs after ligation of the vena cava is often seen, but usually is not permanent. Persistent oedema in those few cases in which it occurs is rarely severe enough to incapacitate the patient. Much of this swelling may be due to further thrombosis rather than mechanical interference with the circulation, and adjuvant treatment with anticoagulant drugs is therefore essential in some cases. Despite the apparent profusion of the alternative venous channels available,[2] careful anatomical study has shown that the arrangement of the venous valves, directing blood flow towards the parent vessels, frequently bars the use of certain anastomotic channels until they have become so distended that the valves are rendered incompetent.[3] Interesting studies of the venous pressure in the legs have

[1] *Surg. Gynec. Obstet.*, 1947, **84**, 385.
[2] Homans, J., ibid., 1944, **79**, 70.
[3] Edwards, E. A., and Robuck, J. D., ibid., 1947, **85**, 547.
[4] Burch, G. E., and Winsor, T. (1943). *Proc. Soc. Exp. Biol., N.Y.*, 1943, **53**, 135.
[5] Thorpe, Ray C., and Burch, G., *Arch. intern. Med.*, 1947, **80**, 587.
[6] O'Neill, E. E., *New Engl. J. Med.*, 1945, **232**, 641.
[7] Collins, C. G., Jones, J. R., and Nelson, E. W., *N. Orleans med. Surg. J.*, 1943, **95**, 324.
[8] *New Engl. J. Med.*, 1946, **235**, 1.

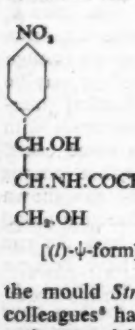
been made,[4 5] and it has been shown that despite greatly increased pressure oedema is usually slight. Furthermore, though the oedema tends to disappear after several months, the venous pressure may remain high for several years. The circulatory adjustments seem adequate, and no detrimental effects are seen; but the compensatory mechanism involved is incompletely understood.

If ligation of the inferior vena cava is to be used more generally it is important that cases should be carefully selected. When embolus has already occurred and there is an undoubted or possible pelvic thrombosis the operation is clearly indicated; satisfactory results have been recorded in gynaecological cases,[6] and the ovarian veins too have sometimes been ligated.[7] When an embolus arises from an unknown source and vein interruption is indicated, the vena cava is the site of election. A further indication for the operation is recurrent embolism after ligation of the femoral veins. Prophylactic ligation of the vena cava may be justifiable during an abdominal operation such as ureteric transplantation for carcinoma of the bladder on the grounds that two major operations constitute a special risk.

Delay in undertaking operation may greatly increase its danger in cases of repeated embolism. Thus death occurred in 9 out of 21 cases reported by Moses,[8] and, while it is certain that some of the survivors would have died from embolus had operation been withheld, it is likely that there would have been fewer fatalities if the only treatment adopted had been the administration of anticoagulant drugs. Before deciding on an operation of this severity the surgeon must be convinced that the treatment is not more risky than the condition which it sets out to control. There can be no doubt, however, that ligation of the inferior vena cava, wisely and properly practised, will prove a valuable weapon in the conquest of pulmonary embolism on those few occasions when anticoagulant therapy is impracticable or impossible. With adequate supplies of heparin available it would seem unlikely that ligation of the inferior vena cava will be widely practised by surgeons in this country.

SYNTHETIC CHLORAMPHENICOL (CHLOROMYCETIN)

Although some penicillins have been synthesized and new penicillins have been created by the chemists, the processes involved are complex, and synthetic penicillins have not yet come into general use. Controulis, Rebstock, and Crooks,[1] however, have recently synthesized chloromycetin, to which the name chloramphenicol has now been given.



[(*l*)-ψ-form]

We have already referred to early reports on the use of this drug in infections in man.[2 3] Encouraging results have been obtained in typhoid fever,[4] typhus fever,[5] scrub typhus,[6] and Rocky Mountain fever.[7] The synthetic product, the structural formula of which is here shown, is (*l*) ψ-1 *p*-nitrophenyl-2-dichloroacetamidopropane-1 : 3-diol; it has apparently the same physical and chemical properties as the chloramphenicol produced by the mould *Streptomyces venezuelae* n.sp. Smadel and his colleagues[8] have reported that the synthetic product has an action on rickettsiae and viruses in developing hens' eggs, mice, and human beings which is identical with that of the product produced by the mould. In developing hens' eggs two doses of the synthetic and natural products produced prolongations of the lives of the chick embryos the mean values of which were practically identical. This was true for *Rickettsia prowazeki*, *R. mooseri*, *R. rickettsi*, *R. akari*, and two strains of *R. tsutsugamushi*, as well as for lymphogranuloma venereum and two strains of psittacosis virus. Mice infected with the Karp strain of *R. tsutsugamushi* received a single daily intraperitoneal injection of solutions of the two types of the drug varying in amount from 0.375 to 2.5 mg. per day per mouse; both types effectively prevented death. Similarly, feeding both types of drug to mice infected with psittacosis virus gave results which were identical with those obtained with the natural antibiotic. Finally, two patients with scrub typhus in Kuala Lumpur have been treated with synthetic chloramphenicol. Both patients received the drug orally over a period of 16 hours; the initial doses were 3.0 or 4.0 g. followed by 0.25 g. at three-hourly intervals. The clinical response was the same as that observed in other cases of scrub typhus treated with the natural antibiotic, and there were no toxic reactions. Synthetic chloramphenicol is now being tested prophylactically against scrub typhus in Malaya.

The synthesis and clinical use of an antibiotic is obviously an event of considerable importance, since it opens up fresh fields for the ingenuity of the synthetic chemist. Incidentally, it will be necessary to enlarge the scope of the word antibiotic unless it is to be dropped altogether. Hitherto the term has been applied only to naturally occurring substances endowed with chemotherapeutic powers and produced by micro-organisms during their growth and metabolism.

1 *J. Amer. chem. Soc.*, 1949, in press.
2 *British Medical Journal*, 1948, **2**, 428.
3 Ibid., 1948, **2**, 1113.
4 Woodward, T. E., *et al.*, *Ann. Intern. Med.*, 1948, **29** (O.S. **33**), 131.
5 Smadel, J. E., *et al.*, *Proc. Soc. exp. Biol., N.Y.*, 1948, **68**, 9.
6 —— *Science*, 1948, **108**, 160.
7 Pincoffs, M. C., *Ann. intern. Med.*, 1948, **29**, 656.
8 *Proc. Soc. exp. Biol., N.Y.*, 1949, **70**, 191.

THE TONGUE IN VITAMIN-B DEFICIENCY

Dietary deficiencies of nicotinamide, riboflavin, pyridoxin and biotin are each reported to have caused lesions of the tongue, which are also common in diseases associated with nutritional disturbance, such as pernicious anaemia, sprue, and other intestinal disorders. These lesions can now be detected at an early stage by inspecting the tongue under ultra-violet irradiation screened with Wood's glass. The appearance of the normal tongue under irradiation was described 20 years ago by Bommer,[1] who observed a red fluorescent coating on the lingual dorsum. Later Radley and Grant[2] reported that the mucous membrane of the tongue shows a greyish or yellowish-white fluorescence, while towards the back the fluorescence is often red or orange. The possible nutritional significance of the fluorescence, however, was not at first realized, though Costello and Luttenberger[3] were aware of reports that the fluorescent coating disappears in vitamin-B deficiency. In following up this clue Hagerman and Hirschfeld[4] have recently examined over 543 patients attending a dermatological out-patient clinic. In 155 patients the fluorescence extended over the entire lingual dorsum, and in another 174 at least half the area was covered. These 331 cases were considered normal, while the remaining 212 cases, in which the fluorescent coating was defective or absent, were considered abnormal.

All the cases, without reference to the fluorescence of their tongues, were next divided into two groups according to whether their skin diseases were or were not considered

1 *Acta derm.-venereol., Stockh.*, 1929, **10**, 253.
2 *Fluorescence Analysis in Ultra-Violet Light*, 1935. London.
3 *N.Y. St. J. Med.*, 1944, **44**, 1778.
4 *Acta derm.-venereol., Stockh.*, 1947, **27**, 369.
5 *Amer. J. Dis. Child.*, 1947, **74**, 657.

to be associated with vitamin-B deficiency. Unfortunately the authors do not clearly describe the method used to come to a decision in each case, but fungous infections, pyodermas, and infestations were considered not to be related to vitamin-B deficiency. When the two groups were compared the proportion of cases with abnormal fluorescence of the tongue was found to be significantly greater in those with diseases supposed to be associated with vitamin-B deficiency than in those with the other skin diseases. In addition, the authors observed that the tongues of patients who had been dosed with B vitamins before coming to hospital usually showed normal fluorescence, irrespective of the nature of their skin disease. They therefore gave vitamin-B preparations, either orally or by injection, to 196 of the patients with abnormal fluorescence of the tongue; in 141 of these the abnormality disappeared. Parenteral therapy appeared to give better results than oral, and vitamin-B preparations containing pantothenic acid were much more effective than those not containing this factor.

Possibly this method of examination could be used for the diagnosis of the vitamin-B deficiency, but further careful investigation will be necessary before the significance of defective fluorescence is fully understood. It is not clear, for example, whether the abnormality results from deficiency of one particular B vitamin, presumably pantothenic acid, or whether it may also be caused by lack of other B vitamins. However, the possible effects of age and other factors unrelated to nutrition must not be overlooked. Similar difficulties have arisen in attempts to distinguish abnormalities of the tongue visible in ordinary light which are thought to be associated with vitamin-B deficiency. Thus Bakwin and his colleagues[3] examined the tongues of 60 children over an extended period and classified the lesions as acute glossitis, glossitis migrans, mild swelling of the tongue, and fissures of the tongue. The diets of these children were not demonstrably different from those of similar children without tongue lesions. In some of the children with swollen and fissured tongues improvement followed the administration of nicotinamide, though none were completely cured even after prolonged treatment. Glossitis migrans was unaffected by nicotinamide, and acute glossitis improved spontaneously or after chemotherapy. From these observations they conclude that the lesions of the tongue commonly seen in children in the U.S.A. are not due to deficiency of nicotinamide, though its administration may be beneficial. The conclusions reached by the Swedish and American workers, therefore, differ both in the degree of importance which should be ascribed to dietary deficiency in causing tongue abnormalities and in the selection of the B vitamin to which special importance is attached. With the wide differences present in the ages, diets, and circumstances of the groups of patients examined an explanation of this divergence of view might not be hard to find. It is obvious, however, that this is a complex problem, and the results of these and similar investigations must be interpreted with caution.

DUPUYTREN'S CONTRACTURE

Though Sir Astley Cooper[1] appears to have been aware in 1822 that the deformity now known as Dupuytren's contracture was confined to the palmar fascia, Dupuytren[2] was the first surgeon to investigate this condition by dissection and thereby reveal its true site. Since then various theories have been advanced to explain its nature, and recently Tord Skoog[3] has made a special study of the deformity at Sir Archibald McIndoe's plastic surgery unit at East Grinstead and at the University of Uppsala in Sweden. His investigations have shown that the palmar aponeurosis is most strongly developed on its ulnar aspect and that this tissue has a poor blood supply and is sparsely supplied with nerves. In movements of precision the plentifully muscled radial part of the hand is mainly used, while the ulnar side acts as a support and is thus more exposed to repeated and sustained trauma.

The condition occurs mainly in men, only 15% of the patients being women, and nearly all the patients are over the age of 40. The lesion becomes more severe with advancing years. It is mainly bilateral in incidence, and the ring and little fingers are chiefly affected, the appearance of a subcutaneous nodule in the palm being the first sign. The thumb is rarely involved, since in most hands the palmar fascia does not extend to this digit. The condition progresses slowly if untreated, and though it remains confined to the palmar aponeurosis it produces secondary changes in the contracted joints. Skoog gives evidence that trauma is the most important aetiological factor. Histological examination shows richly cellular areas of connective tissue containing blood pigment in the fascia; as the connective tissue degenerates with advancing age it loses its elasticity and is replaced by dense collagen bundles; thus the retraction characteristic of the condition is produced. Skoog mentions the association of Dupuytren's contracture with knuckle pads, and he believes that the frequency with which the condition occurs in epileptics may be connected with the prolonged administration of phenobarbitone. There is also undoubted evidence of a hereditary factor depending on dominance of low penetrability which is sex linked. Other aetiological theories have little to support them.

The best treatment is removal of the affected palmar fascia by operation, and Skoog favours Sir Archibald McIndoe's procedure. A transverse incision is made in the neighbourhood of the distal palmar crease. Where the fingers are affected a Z-shaped incision is used on the palmar surface of the finger over the proximal phalanx in order to lengthen the skin in this area. A tourniquet is essential to permit an accurate, gentle, and complete dissection. To remove completely the deep extensions and to avoid damage to the flexor tendons, vessels, and nerves, longitudinal incisions are made over these structures, which should first be identified outside the contracted mass of fibrous tissue and carefully followed through this tissue. Secondary changes in the finger joints will require prolonged and careful after-treatment, and in this connexion active movements must accompany splinting in extension. Splinting alone is dangerous, since the fingers quickly become stiff and the result of treatment is worse than the disease itself. The chief dangers to be avoided are post-operative haematoma and sepsis. Provided severe secondary changes have not already occurred the results of operative treatment have proved to be excellent. Many attempts have been made to find a reliable method of treating this condition without operation. A correspondent[4] in the *Journal* recently drew attention to the value of radiotherapy.

Skoog also describes a similar condition affecting the plantar fascia in its medial part, in the region of the base of the first metatarsal and first cuneiform. Operative removal is rarely required, but when this is necessary excision should be confined to the diseased area. The dissection should not be widespread as in the palm owing to the danger of interfering with the integrity of the arches of the foot.

[1] *A Treatise on Dislocations and Fractures of the Joints*, 1822, London, p. 524.
[2] *Leçons orales de clinique chirurgicale faites à l'Hôtel-Dieu de Paris*, Paris. 1832. Translated into English in *Lancet*, 1834, **2**, 222
[3] *Acta chir. scand.*, 1948, **96**, Suppl. 139.
[4] *British Medical Journal*, 1947, **2**, 942.

SOME OBSERVATIONS ON THE TEACHING OF PATHOLOGY IN THE U.S.A.

BY

K. R. HILL, M.D.

(From the Department of Pathology, Medical School, King's College, University of Durham, and the Royal Victoria Infirmary, Newcastle-upon-Tyne)

The recent report of the B.M.A. Medical Curriculum Committee (*The Training of a Doctor*, 1948; Butterworth, London) has raised many controversial points which will be disturbing to some and welcome to others engaged in the teaching of medicine. It may be of interest at this time to study methods of teaching in other countries, and it is proposed, therefore, to comment on teaching in America, confining myself to one subject only, pathology. I recently spent a year in the pathology department of a well-known American teaching hospital, and during this time was able to visit and study methods at five other widely separated teaching institutions, two of them State university medical schools.*

At the outset it must be mentioned that in the U.S.A. medical students (excluding ex-Service men) are, on the average, three years older than their British counterparts. Most American students have taken a degree in arts or science (often including physics, chemistry, and biology) before entering medical school, which they do at the age of 21 or over. Probably as a consequence of being older and having had a university education, American students are more mature in outlook and have a more lively sense of the value of their studies in pathology and its application to medicine than English students. There was no evidence of previous cramming, and the scientific knowledge garnered in preceding years was often applied to the problems of pathology with an eagerness which led students into research projects as undergraduates.

Whether or not it is desirable to insist on a university degree as a necessary qualification before taking up a medical training is debatable. Although this is generally done in America, it is interesting to record the fact that wherever I went I found that the English medical student (and doctor) had a high reputation for general culture. The batch of undergraduates who were trained in the U.S.A. during the war enhanced the reputation of British students immeasurably. Further, one eminent pathologist and teacher told me that the English system of going straight from school to medical training was the best, as it enabled the student to get rid of his factual training quickly and then settle down to doing real useful thinking and worth-while work (e.g., research, postgraduate specialization) before the age of 30.

After entrance the general medical course consists of four years' graded instruction, at the end of which an examination for the M.D. degree is taken; then follows a year's internship. The four-years course is carefully integrated as a whole, and generally consists of: first year, anatomy and physiology; second year, pathology and associated subjects; third and fourth years, clinical subjects. During the preclinical and very often during the clinical period of training, instruction is carried on throughout the academic year of about eight months with very little break for vacation. Often the long vacation is filled in taking an extra elective course—e.g., obstetrics, pathology, or a research problem—but it also may be occupied in doing a job ("working one's way through college") or a military commitment.

Undergraduate Training in Pathology

Pathology is generally taught in the second year, and, though on paper it may be considered a preclinical subject, it is in practice never taught without the association of a hospital background, and the correlation between lesions and functional alterations is constantly stressed. Although the main course is in the second year, in many schools there is often systematic training also in the third year, and in all cases pathology is kept constantly in the students' minds during their clinical training by clinico-pathological conferences, pathology staff conferences, special gynaecological pathology, surgical pathology, and "grand rounds."

Bacteriology, chemical pathology, haematology, and clinical biology (serology) are taught as separate subjects in their own departments and not, as a rule, with pathology. The main course in pathology may extend throughout the whole academic second year or may, as in some schools, be compressed into two terms.

In nearly all schools visited a systematic course of lectures was given. In one or two schools the lectures departed from the usual scheme and dealt only with recent theoretical or research aspects not yet appearing in the textbooks or aspects not generally emphasized by the textbooks—e.g., collagen vascular diseases, deficiency diseases, etc.

One eminent authority told me that systematic lectures were a waste of time and that their only use was to give practice to the junior members of the staff in preparing their subject and in lecturing before an audience.

Besides lectures there were classes in morbid anatomy and histopathology. In conducting these a feature which was quite common was the effort to bring together teacher and student in close personal relationship. The classes were divided into small groups, comprising not more than a dozen students, and a large number of instructors ensured attention to the requirements of the individual student.

Specimens representing each disease or group of diseases were concentrated in separate rooms, where for about two weeks they were studied by a group of students in turn under their instructors. In some cases the instructors remained with their particular group of students throughout the academic year, circulating through the different rooms with them. In others, specialists in the branch of pathology represented by the specimens in the particular room dealt with each group of students as they came through.

The first method is much more personal—more akin to the "supervision" or "tutor system" that prevails in our older universities. It leads to a more intimate relationship which helps to iron out the difficulties of the individual, and in practice particular groups put on a demonstration and discussion with their tutors which lasts into the late hours of the evening—often to finish up in the local beer-parlour! The advantage of the second method is that specialists are brought directly into contact with the student: neuropathology is taught by neuropathologists, gynaecological pathology by gynaecologists with an interest in the pathological side, and so on.

The specimens in the rooms were from necropsies going back many years, preserved in large jars of formalin. Thus in one room cases representing tuberculosis were collected, in another cardiovascular diseases, in a third genito-urinary diseases, and so on. The specimens were loose and were handled both by demonstrators and by students.

Mounted specimens were also used in these rooms for demonstration purposes. Some institutions had a museum of mounted specimens for teaching purposes, but I gained the impression that, generally, museums were for the housing of historical specimens and oddities rather than for teaching.

There was always an efficient filing system, so that reference could be made to the history and the microscope slides relating to the cases in the gross-specimen rooms. A very useful exercise within the groups was for one student to present a series of cases compiled from the files to illustrate a special feature of pathology.

Microscope slides and protocol files were never sacrosanct. I asked once if there was no concern over the loss of slides in this sort of system. I was told it was better to have the slides used and lost rather than never used at all, and so far as I could see there were comparatively few losses considering the amount of use the collections were given.

Concurrent with the study of gross specimens, histopathology relating to the group of diseases studied in each particular room was carried out. Nearly always a member of the staff was present, and the procedure was to alternate between gross-specimen rooms and microscopy rooms.

As a rule the student was given 200 to 400 representative slides portraying pathological processes, and histological

*I held a Rockefeller Fellowship at the Johns Hopkins Hospital, 1947–8, and visited the Universities of Chicago, Cornell, Harvard, Maryland, and Illinois.

patterns were stressed rather than detailed cytology. As a consequence of this the micro-projector could be used, and was used extensively (in the U.S.A. the micro-projector always seems to be efficient); this I found was a distinct advantage in indicating to the students the exact lesion under discussion. The micro-projector could be employed in this country much more extensively, not only by students but also for the purposes of illustrating lesions at clinical meetings.

Often the groups or the class as a whole had weekly recitations or "quiz" exercises similar to our "rags" or "bottle parties." They were a popular feature, and the students found them very instructive.

In all schools attendances at necropsies were given high importance. In schools using the group system of teaching, the group attended the necropsies performed by the group member of the staff. Embalming of bodies is often carried out in the United States, and as a consequence hospitals generally have a 24-hour necropsy service in order to accommodate the undertakers. It is not unusual, therefore, to see a group of students attending a necropsy into the small hours of the night with their staff member.

Generally the students assist the pathologist (doing the "dirty work," such as the opening of the gut), but in some hospitals students may carry out complete necropsies under supervision. In several schools it was the practice for a team of four to take over a case, and later one would present the history, another would demonstrate gross specimens, another the histology, and a fourth would give the final commentary. The whole team was often responsible for the histology blocks being embedded, cut, and stained.

Often the necropsies of one day were presented next day or on specified days during the week, when the whole class or smaller groups attended. In general, specimens are preserved in formalin, although the use of the deep-freeze for gross specimens is on the increase; this method has the advantage of preserving the natural appearances when thawed.

One university makes extensive use of colour photography of gross specimens and has collected a very complete library of lantern slides, so that any disease can be quickly illustrated on the screen. Excellent though this may be, it has the very obvious danger of being so easy to use that it may exclude the seeing and handling of the actual diseased organs, which, to my mind, is so important in the teaching of pathology.

In passing it might be noted that, although many necropsy theatres have special galleries for students to watch the performance of a necropsy, I never saw one in use.

During all this time it is possible for a student, or several students together, to carry out a research problem, and many do so. This may consist of a compilation of post-mortem reports and material or pure experimental work on animals. I remember well at one institution, when Trueta's book on the renal circulation became so much talked about, two students approaching the professor of urology and asking if they could repeat some aspects of Trueta's work. They were told, "There is the lab.; get on with it." I asked if these students would get anywhere with the problem, and was told, "Probably not, but they will learn something and think for themselves. That is why they are here." This typifies the attitude of the whole medical staff of these teaching institutions, and it is an attitude which is not confined only to the pathology department.

In most of these institutions much more stress is put on experimental work than in England. More and more it may be said that the pathology taught in the States is functional pathology rather than just the study of "dead issues"—although morbid anatomy as taught by the German and Scottish schools is not neglected. To this end functional alterations are emphasized as much as the lesions for which they are the cause or with which they may be associated. As an example of this method of teaching, one institution names the practical part of its course "pathological anatomy and physiology," and states that the course is "meant to present systematically the anatomical, chemical, and functional changes which occur in the commoner human diseases." As a result the medical student is much more experimentally and research minded than his British counterpart.

Perhaps an extreme example of this has been reached at one institution where for one term groups of students are given experimental problems on animals—e.g., vascular occlusions, diet experiments, and so on—for the study of various cause-and-effect processes in pathology. This method of teaching functional pathology is as yet in its experimental stage, and its results are still *sub judice*. Opportunity for research is arranged for by the fact that courses are so planned that students are left with a third to a quarter of their course as free time.

One interesting aspect of the medical training is the elective course, in which a student voluntarily chooses to do pathology or some other subject. If he takes pathology he functions as a junior member of the staff (even though he be only a second-year student), performs necropsies (under supervision), and presents his completed case with the histology to the chief of the department. I was most impressed with this aspect, for I heard second-year students present their cases with the aplomb of many an experienced pathologist.

Throughout the clinical years the pathology department constantly influences the student in training. At least once a week, and often many times more, the student will view histological patterns of diseases shown on the screen by the micro-projector, see gross specimens, and hear them discussed at various hospital conferences. Further, he will attend special pathology classes, either compulsory or elective, in surgery, gynaecology, ophthalmology, dermatology, and neuropathology. One good method which is often practised is to bring in the clinician at these classes. The clinician reads out the case history, shows lantern slides and radiographs of the patient, and discusses prognosis; the pathologist in his turn demonstrates the gross specimen (or shows a lantern slide of it) and then discusses the histological pattern. This adds interest to an otherwise often uninteresting subject.

It is my impression that throughout his course the American student is much more histologically minded than his English counterpart. Certainly he does not have to learn a word-picture of a histological appearance from Boyd's textbook before his examination. These remarks also apply to the postgraduate in subjects other than pathology.

Postgraduate Teaching of Pathology

It is a not uncommon practice in the States for a student, after passing his M.D., to do his internship in pathology. It should be noted that up to the time of taking his M.D. he has had only two academic years of clinical training. To those who have gone through the gamut of the longer British training this early specialization in pathology after such a brief clinical training sounds incredible. I asked the doyen of American pathologists whether he thought this system was a good one; he replied, "It is unnecessary for embryo pathologists to waste time doing clinical jobs."

I formed the opinion that, in American teaching hospitals, once a specialist had completed his period of postgraduate training he tended to broaden his viewpoint by close association and frequent conferences with other departments. In England, on the other hand, although we insist on our specialists having a much wider background of initial training, perhaps they tend to tread the narrow path of their own specialty once they are established and the years roll on.

In my experience the training of pathologists was excellent. In the first place, juniors (or "residents") were accepted by the senior members of the staff as equals, although it was obvious that at first the senior members were talking right over their heads. This stimulus to, shall we say, self-respect and higher thinking paid dividends, and the progress of the trainee pathologists was phenomenal. Furthermore, the junior was straightway given a responsible job. For example, he would be sent to the surgical pathology department, for which he would be responsible for three months. His work was of course checked by a senior member of the department every day, but he was primarily responsible for the gross and microscopical descriptions of the specimens, and also did all the emergency frozen-section reports. A junior resident thus worked very hard, and during his tour of duty had almost a twenty-four hours day.

In the training of the pathologist necropsy work was all-important. The junior performed necropsies at first under supervision. A week after the necropsy he would present his report together with the gross specimens to a senior member of the staff, who in turn would dictate a further commentary. Some time later the junior would present the microscopical sections to this senior member of the staff; and, in passing, it may be noted that all special stains were done by the trainee pathologist himself. The senior member would write a final commentary or, if it was of particular interest, would put the case up for presentation at the weekly staff conference before the head of the department. At this conference the junior would present the case to the chief, who would write his final commentary. By this method of checking first at the gross-specimen stage, then at the microscopy stage, the facts were well inculcated; and when the chief discussed these facts and added his own observations emphasizing the importance of the pathological processes involved the case finally was nicely orientated within the resident's mind.

In addition to weekly conferences on necropsies there were intra- and inter-departmental conferences in which the junior members took part. One such conference was that of surgical pathology, at which the interesting histopathology of the preceding week was brought to the notice of the whole department. An excellent feature of this conference was the description of the patient given by a resident whose duty it was regularly to attend the tumour clinic where he had seen the patient. This resident at some other time would present the histopathology to the surgical staff of the tumour clinic.

The resident staff were also involved in the preparation and presentation of regular conferences held in conjunction with the paediatric and the obstetrical departments, at which infant and foetal deaths were reviewed respectively.

At one institution the pathology department would give a review of a particular disease or pathological process as it presented itself after examination of the hospital records. At the conference clinicians and pathologists would present their respective observations and conclusions (and these were often original) and a discussion would ensue. As the resident staff were often responsible for doing the "spade work" for such conferences they gained valuable experience in bringing together several aspects of pathology.

Within the pathology department one found, besides the trainee pathologists, trainee specialists from other departments, such as medicine, surgery, and radiology, who were there for instruction for one year. This added a leavening of clinical personnel which was very healthy and made liaison with other departments easier. At one institution the radiologists under training were utilized at all conferences to collect and interpret the radiographs, and I would strongly recommend this procedure.

Comments

The method of dividing pathology classes into small groups which, together with their tutors, circulate through special study rooms in which are concentrated specimens representing various diseases is recommended.

Pathology in America is taught with much more of a functional application than it is in this country. The importance of experimental pathology is stressed—in some cases perhaps too much, as students may occasionally think in terms of airy experimental theories rather than of the solid facts of morbid anatomy.

The micro-projector should be used much more in England, and, although one cannot teach detailed cytology by such methods, histological patterns of disease can be illustrated and be constantly put before the student of pathology as well as before clinical and postgraduate students. Pathology need not therefore be a watertight subject that too often is forgotten as soon as the pathology examination is past.

The American method of early specialization in pathology is open to criticism on the ground that students have had too brief a contact with the living patient (i.e., sometimes only two academic clinical years). In England the pathologist has had at least three full years' clinical experience before graduation, followed, very often, by a year or so of house jobs.

The graded checking of the work of the trainee pathologist in the States is excellent, as is the early assumption of responsibility. The constant use of clinico-pathological conferences brings all aspects of medicine and surgery to the pathologist's notice, thus broadening his vision.

NEW POISONS RULES

AMENDMENTS CONSOLIDATED

The Poisons Rules, 1949,* which were laid before Parliament on March 25, came into operation on April 11. This revision of the Poisons Rules (Statutory Instruments, 1949, No. 539) replaces the Poisons Rules of 1935 made under Section 23 of the Pharmacy and Poisons Act, 1933, and all the amendments to those rules which have been issued from time to time.

The Fourth Schedule again lists those substances required to be sold by retail "only upon a prescription given by a duly qualified medical practitioner, registered dentist, registered veterinary surgeon, or registered veterinary practitioner." Such substances will continue to be governed by the rule which lays down that a prescription shall:

(*a*) be in writing and be signed by the person giving it with his usual signature and be dated by him;

(*b*) except in the case of a health prescription, specify the address of the person giving it;

(*c*) specify the name and address of the person for whose treatment it is given or, if the prescription is given by a veterinary surgeon or practitioner, of the person to whom the medicine is to be delivered;

(*d*) have written thereon, if given by a dentist, the words "For dental treatment only" or, if given by a veterinary surgeon or practitioner, the words "For animal treatment only";

(*e*) indicate the total amount of the medicine to be supplied and, except in the case of a preparation which is to be used for external treatment only, the dose to be taken.

In an emergency an authorized seller of poisons may supply a doctor without a written order, say in response to a telephone request, if the practitioner gives an undertaking that such an order will be furnished within the next twenty-four hours.

The poisons listed in the Fourth Schedule are as follows:

Allylisopropylacetylurea
Amidopyrine; its salts
Barbituric acid; its salts; derivatives of barbituric acid; their salts; compounds of barbituric acid, its salts, its derivatives, their salts, with any other substance
Dinitrocresols except agricultural or horticultural insecticides or fungicides; dinitronaphthols; dinitrophenols; dinitrothymols
6-morpholino-4 : 4-diphenylheptane-3-one; its salts
Para-aminobenzenesulphonamide; its salts; derivatives of para-aminobenzenesulphonamide having any of the hydrogen atoms of the para-amino group or of the sulphonamide group substituted by another radical; their salts, except when contained in ointments and surgical dressings
Phenylcinchoninic acid; salicyl-cinchoninic acid; their salts; their esters
Sulphonal; alkyl sulphonals
Tridione (3 : 5 : 5-trimethyloxazolidine-2 : 4-dione)

Most of these substances are better known to practitioners under trade or other names.

A prescription which comes under the Fourth Schedule must not be dispensed more than once unless the prescriber directs that it may be dispensed a stated number of times or at stated intervals. There must be noted on the prescription the name and address of the seller and the date on which the prescription was dispensed. The prescription must also be retained and kept on the premises for two years so that it is readily available for inspection. This last provision does not apply to a "health prescription," which is defined as a prescription given by a doctor or a dentist in accordance with the National Health Service Act, 1946, or the National Health Service (Scotland) Act, 1947, or given by a doctor or dentist upon a form issued by a local authority for use in connexion with the health services of that authority.

*Poisons: The Poisons Rules, 1949, H.M.S.O., price 9d.

Special Hospital Provisions

Medicines containing poisons which are supplied to patients in hospitals or in out-patient departments are subject to much the same rules. Where substances included in the First Schedule to the Rules are supplied a record must be kept for two years of the name and quantity of the poison supplied, the date on which it was supplied, the name and address of the patient, and the name of the person who supplied the poison or who gave the prescription for it. Again this rule does not apply to prescriptions given by doctors or dentists under the N.H.S. Acts. The containers of such medicines must be labelled with a designation or address sufficient to identify the hospital, or dispensary, or health centre issuing it.

Medicines containing poisons shall be supplied only for use in wards, operating theatres, or other departments on a written order signed by a doctor, or dentist, or "by a sister or nurse in charge of a ward, theatre, or other section of the institution." Again the container of the medicine must be labelled with words describing its contents and in the case of substances included in the First Schedule with a distinguishing mark indicating that it must be stored in a cupboard reserved solely for the storage of poisons.

Where poisons are stored on shelves in a dispensary or pharmaceutical department the container of the poison "must be rendered distinguishable by touch from the containers of articles other than poisons stored on the same premises." All places in which poisons are stored must be inspected at regular intervals, not exceeding three months, by a pharmacist or some other person appointed by the governing body or person in control of the institution.

First Schedule

Substances included in the Poisons List to which special restrictions apply are as follows:

Alkaloids, the following; their salts, simple or complex:
Acetyldihydrocodeinone
Aconite, alkaloids of, except substances containing less than 0.2 per cent of the alkaloids of aconite
Apomorphine except substances containing less than 0.2% of apomorphine
Atropine except substances containing less than 0.15% of atropine
Belladonna, alkaloids of, except substances containing less than 0.15% of the alkaloids of belladonna calculated as hyoscyamine
Benzoylmorphine
Benzylmorphine
Brucine except substances containing less than 0.2% of brucine
Calabar bean, alkaloids of
Coca, alkaloids of, except substances containing less than 0.1% of the alkaloids of coca
Cocaine except substances containing less than 0.1% of cocaine
Codeine except substances containing less than 1.5% of codeine
Colchicine except substances containing less than 0.5% of colchicine
Coniine except substances containing less than 0.1% of coniine
Cotarnine except substances containing less than 0.2% of cotarnine
Curare, alkaloids of; curare bases
Diacetylmorphine
Dihydrocodeinone
Dihydrodesoxymorphine
Dihydrohydroxycodeinone
Dihydromorphine
Dihydromorphinone
Ecgonine except substances containing less than 0.1% of ecgonine
Emetine except substances containing less than 1% of emetine
Ergot, alkaloids of
Ethylmorphine except substances containing less than 0.2% of ethylmorphine
Gelsemium, alkaloids of, except substances containing less than 0.1% of the alkaloids of gelsemium
Homatropine except substances containing less than 0.15% of homatropine
Hyoscine except substances containing less than 0.15% of hyoscine
Hyoscyamine except substances containing less than 0.15% of hyoscyamine
Jaborandi, alkaloids of, except substances containing less than 0.5% of the alkaloids of jaborandi
Lobelia, alkaloids of, except substances containing less than 0.5% of the alkaloids of lobelia
Morphine except substances containing less than 0.2% of morphine calculated as anhydrous morphine
Nicotine
Papaverine except substances containing less than 1% of papaverine
Pomegranate, alkaloids of, except substances containing less than 0.5% of the alkaloids of pomegranate
Quebracho, alkaloids of
Sabadilla, alkaloids of, except substances containing less than 1% of the alkaloids of sabadilla
Solanaceous alkaloids, not otherwise included in this Schedule, except substances containing less than 0.15% of solanaceous alkaloids calculated as hyoscyamine
Stavesacre, alkaloids of, except substances containing less than 0.2% of the alkaloids of stavesacre.
Strychnine except substances containing less than 0.2% of strychnine
Thebaine except substances containing less than 1% of thebaine
Veratrum, alkaloids of, except substances containing less than 1% of the alkaloids of veratrum
Yohimba, alkaloids of
Allylisopropylacetylurea
Amidone (*dl*-2-dimethylamino-4 : 4-diphenyl-heptane-5-one); its salts
Amidopyrine; its salts
Amino-alcohols, esterified with benzoic acid, phenylacetic acid, phenylpropionic acid, cinnamic acid or the derivatives of these acids, except in substances containing less than 10% of esterified amino-alcohols
Antimonial poisons except substances containing less than the equivalent of 1% of antimony trioxide
Arsenical poisons except substances containing less than the equivalent of 0.01% of arsenic trioxide and except dentifrices containing less than 0.5% of acetarsol
Barbituric acid; its salts; derivatives of barbituric acid; their salts; compounds of barbituric acid, its salts, its derivatives, their salts, with any other substance
Barium, salts of
Beta-aminopropylbenzene; its salts, its N-alkyl derivatives; their salts; beta amino*iso*propylbenzene; its salts; its N-alkyl derivatives; their salts
Cannabis; the resins of cannabis; extracts of cannabis; tinctures of cannabis; cannabin tannate
Cantharidin except substances containing less than 0.01% of cantharidin
Cantharidates except substances containing less than the equivalent of 0.01% of cantharidine
Carbachol
Digitalis, glycosides and other active principles of, except substances containing less than one unit of activity (as defined in the *British Pharmacopoeia*) in two grammes of the substance
Dinitrocresols except agricultural and horticultural insecticides or fungicides; dinitronaphthols; dinitrophenols; dinitrothymols
Ergot; extracts of ergot; tinctures of ergot
Guanidines, the following: polymethylene diguanidines, dipara-anisyl-phenetyl guanidine
Hydrocyanic acid except substances containing less than 0.15%, weight in weight, of hydrocyanic acid (HCN); cyanides except substances containing less than the equivalent of 0.1%, weight in weight, of hydrocyanic acid (HCN); double cyanides of mercury and zinc
Lead, compounds of, with acids from fixed oils
Mercuric chloride except substances containing less than 1% of mercuric chloride; mercuric iodide except substances containing less than 2% of mercuric iodide; nitrates of mercury except substances containing less than the equivalent of 3%, weight in weight, of mercury (Hg); potassio-mercuric iodides except substances containing less than the equivalent of 1% of mercuric iodide; organic compounds of mercury except substances containing less than the equivalent of 0.2%, weight in weight, of mercury (Hg)
Metanitrophenol; orthonitrophenol; paranitrophenol
Metopon (methyldihydromorphinone); its salts
6-morpholino-4 : 4-diphenylheptane-3-one; its salts
Nux vomica except substances containing less than 0.2% of strychnine
Opium except substances containing less than 0.2% of morphine calculated as anhydrous morphine
Ouabain
Oxycinchoninic acid, derivatives of; their salts; their esters
Para-aminobenzenesulphonamide; its salts; derivatives of para-aminobenzenesulphonamide having any of the hydrogen atoms of the para-amino group or of the sulphonamide group substituted by another radical; their salts
Pethidine; its salts
Phenetidylphenacetin
Phenylcinchoninic acid; salicylcinchoninic acid; their salts; their esters
Phenylethylhydantoin; its salts; its acyl derivatives; their salts
Picrotoxin
Savin, oil of
Sodium, monofluoracetate
Strophanthus, glycosides of
Sulphonal; alkyl sulphonals
Thallium; salts of

Tribromethyl alcohol
Tridione (3 : 5 : 5-trimethyloxazolidine-2 : 4-dione)
Zinc phosphide

In the Third Schedule of the Poisons Rules there are listed articles exempted from the provisions of the Pharmacy and Poisons Act and of the Rules. These include, for example, extracts and tinctures of ipecacuanha and substances containing less than 0.05% of emetine; substances containing less than 10% of chloroform; and ointments containing less than 3%, weight for weight, of mercury.

The other schedules follow the pattern laid down in the twelve schedules of the 1935 Poisons Rules. An additional four schedules are concerned with such things as the purchase of strychnine for killing seals and the colouring of some compounds of arsenic.

MISSIONARY ENDEAVOUR

C.M.S. Celebrations

The Church Missionary Society celebrated on April 12 its 150th anniversary. It was founded in an Aldersgate Street tavern in 1799 by a group of 16 clergy and 9 laymen with whom William Wilberforce and Zachary Macaulay were associated, though they were not present at that first meeting. The first interest of the Society was in Africa, and a few years later it entered India and Ceylon. Work in China was undertaken in the 'forties of the last century, and in Japan and Persia some thirty years later. The Society is now responsible for more than half the missionary force of the Church of England and for about a quarter of the total missionary work of British societies. It has nearly one thousand missionaries on its register, about two-thirds of whom are women.

The first medical missions under the Society's auspices were not inaugurated until 1865. Doctors had been sent abroad by the Society from 1840 onwards, but not as missionaries; their work was to care only for the health of the missionaries proper. The first C.M.S. medical mission was started in the native state of Kashmir. The next was at Hangchow in 1871. In the ten years from 1880 to 1890, hospitals were opened in Persia, Palestine, India, and Egypt. A C.M.S. hospital was established in 1897 at Mengo in Uganda Protectorate. A full account of the work done there under the direction of Sir Albert Cook appeared in these columns on the occasion of the Mengo Hospitals Jubilee (Aug. 30, 1947, p. 342). The C.M.S., which is responsible for half the medical work of Anglican missions, now has 51 hospitals and 149 dispensaries. More than five million treatments are given each year, and in every hour of the day more than 500 patients receive some form of treatment through C.M.S. hospitals, out-stations, welfare centres, and clinics.

The burden of rising costs affects missionary societies as much as other institutions. It is not only at home that money values have altered. In China it now costs as much to put in the windows of a rebuilt hospital as it cost to build the entire hospital before the war. In East Africa nurses' uniforms cost twice as much as they did, and the cost of medicines has gone up sixfold. In India the maintenance cost of a hospital bed has trebled.

The number of European-trained nurses working for the Society is 105. It was mentioned at a Press conference at the Society's headquarters in Salisbury Square that about 80% of the nurses at work in India are Christians. Many of them have been trained at C.M.S. hospitals. The Indian-trained nurse is almost always the product of Christian example and missionary organization. As for medical men and women, stress was laid at the conference on the fact that for missionary work, especially in certain regions and certain types of service, such as that among lepers, a sense of vocation is needed. Some sense of vocation is called for, of course, in all medical work, but it is especially important in Christian missions, among people alien in thought and custom and in a strange environment. In many lands the Church Missionary Society has led the way to State action in organizing medical services. Now that Government-provided medical services are increasingly widespread in Africa and the East, the aim of the Society's medical missions is changing to the extent that instead of providing centres which specialize in a particular type of medical work it aims at a general healing ministry, integrated with the Society's main evangelical and educational programme. The need for medical services in the lands which the Society occupies remains, of course, overwhelming. In India there is one doctor for every 10,000 people. China, with ten times as many people as there are in the British Isles, has fewer doctors than there are in London.

AMERICAN REVIEW OF SOVIET MEDICINE

The October, 1948, issue of the *American Review of Soviet Medicine*, recently received, contains the announcement that the publication is to be suspended indefinitely. The *Review* first appeared in October, 1943, sponsored by the American-Soviet Medical Society, under the presidency of the late W. B. Cannon. It was designed to publish translations of important papers from Russian medical literature, survey articles of various aspects of Russian medicine by American experts, news of current medical events in the U.S.S.R., reviews of Soviet medical books, etc. Edited throughout its existence by Dr. Henry E. Sigerist, the *Review* made possible a wide exchange of medical information between the Soviet Union and the English-speaking countries, while the American-Soviet Medical Society was able to build up an extensive library of Russian literature. In a valedictory editorial Dr. Sigerist writes: "Much to our regret we are unable to [continue publication] for reasons which are so obvious that we need not elaborate on them." As the difficulty in obtaining medical literature from the U.S.S.R. has not appreciably increased since 1943, other factors must be responsible for the decision to discontinue the *Review*. The American-Soviet Medical Society is to continue in being, and will keep its members informed of medical developments in the U.S.S.R. by issuing mimeographed reports whenever there is an opportunity.

TRAVELLING FELLOWSHIPS IN MEDICINE

The Medical Research Council invites applications for the following Travelling Fellowships for the academic year 1949–50.

Rockefeller Medical Fellowships

These fellowships are provided from a fund with which the Council has been entrusted by the Rockefeller Foundation of New York. They are intended for graduates resident in this country who have had some training in research work in clinical medicine or surgery, or in some other branch of medical science, and who are likely to profit by a period of work at a centre in the United States or elsewhere abroad before taking up positions for higher teaching or research in the United Kingdom. The stipend will ordinarily be at the rate of £650 per annum for a single Fellow, and of £900 per annum for a married Fellow. Travelling expenses and some other allowances will be paid in addition.

Dorothy Temple Cross Research Fellowships in Tuberculosis

These fellowships are awarded by the Council from a special endowment of which it is the trustee. The object of the fellowships, as defined in the trust deed, is to give special opportunities for study or research to suitably qualified British subjects of either sex "intending to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis in all or any of its forms." The fellowships will, as a rule, be awarded to candidates who wish to make their studies or inquiries elsewhere than in the United Kingdom. They will ordinarily be awarded for one academic year. The fellowships provide for the payment of stipend, together with an allowance for travelling and incidental expenses. The stipend will ordinarily be at the rate of £650 per annum for a single Fellow, and of £900 per annum for a married Fellow.

Completed applications for fellowships of either type must be lodged with the Council by June 1. Further particulars and forms of application are obtainable from the Secretary, Medical Research Council, 38, Old Queen Street, Westminster, London, S.W.1.

Reports of Societies

REORIENTATIONS IN NEUROLOGY

At a meeting of the Manchester Medical Society on Feb. 2 Sir CHARLES SYMONDS delivered an address on this subject.

He said that the most fascinating and elusive problem of neurology was that of the selective lesion. This or that structure was picked out again and again by different diseases so that, for example, examination of the pupils alone might warrant the diagnosis of neurosyphilis. Of the reasons for this hardly anything was known, but it might depend partly upon the effect of toxins, or upon deficiencies in specific biochemical functions. Myasthenia gravis was the best-known example of a biochemical lesion; familial periodic paralysis and porphyria were less well understood, but of interest because of the genetic factor. Some of the obscure paralyses, such as that described by Landry, might be caused similarly. The paralysis of botulism and the spasm of tetanus were now known to depend upon derangement of the acetylcholine–cholinesterase mechanism of neuromuscular transmission. There was evidence suggesting that this mode of transmission might also exist within the central nervous system across synapses, and, if so, certain functional nervous disorders might prove to be caused by analogous biochemical disturbances.

Specific patterns of central nervous disease were related to equally specific nutritional deficiencies. Subacute combined degeneration of the cord was one familiar clinical example, and the prison camps in the Far East had provided others. Animal experiments had shown correlation between the histological pattern of lesions and specific vitamin deficiencies, whether due to lack of vitamins or excess of anti-vitamins in the diet. Disseminated sclerosis remained a mystery, but the experimental production by Weston Hurst of demyelination of optic nerves and other structures in the monkey by interference with intracellular oxidation suggested the possibility of a biochemical lesion.

Bodian and Howe had shown that the susceptibility of anterior horn cells to the virus of poliomyelitis could be modified by an artificially induced resting state following section of peripheral nerves. Bodian had further demonstrated that the natural immunity of rhesus monkeys to oral infection by the virus of poliomyelitis was lost when the animal was deprived of pyridoxine. It seemed, therefore, that we might have to think in terms of interaction between virus and metabolic disorder if we were to understand the aetiology of certain nervous diseases.

CHELSEA CLINICAL SOCIETY

The sixth meeting of the session was held on March 8 at the South Kensington Hotel, with the president, Mr. NILS ECKHOFF, in the chair. A discussion on prefrontal leucotomy was opened by Mr. W. MCKISSOCK, who himself had operated on over one thousand cases, and was continued by Dr. CURRAN, whose experience of investigation and aftercare was equally extensive. An interesting discussion ensued in which Drs. BRUNTON BLAIKIE, GUY BEAUCHAMP, FURBER, BUCKLEY SHARP, SKENE KEITH, WATNEY ROE, MOODY, GORSKY, and Mr. CRUMBIE and Mr. GUERRIER took part. Members were asked to take note of the annual dinner date, which was fixed for Tuesday, May 10.

At the third meeting of the Administrative and Clerical Staffs Whitley Council on Feb. 1 it was agreed that the London "weighting" for administrative and clerical officers aged 26 years and over with salaries of under £760 a year should be £30 a year in all sections of the National Health Service. It should now be paid as from Feb. 1 to all such officers employed in the Metropolitan Police area who have not already received it. Agreement was reached on the salaries of senior officers of hospital management committees and boards of management. The salaries are based on a new system by which a varying number of points are allotted to hospitals and institutions of different sizes. The salaries for secretaries vary from £640 by £25 to £890 to £1,400 by £50 to £1,700, and for deputy secretaries from £430 by £15 to £595 to £935 by £30 to £995 by £35 to £1,135. The scales are subject to the addition of London weighting, and they operate as from Jan. 1.

Correspondence

Transmission of Sarcoma by Dried Tissue

SIR,—Professor W. E. Gye (March 26, p. 511) describes a method of extracting a very powerful carcinogen from three sarcomas of mice after a treatment of the tumours by freezing and desiccation which is thought to exclude the survival of any cells. All cancer research workers will congratulate him and his associates on this achievement, and those who have worked with the weaker carcinogens, which take effect chiefly in the second year, will be impressed by the prospect of results obtainable in 2 to 4 weeks after injection.

The results described show undoubtedly that, if the death of all cells can be assured, a very active carcinogen has been obtained from mouse sarcomas. Professor Gye concludes that this particular carcinogen differs from many others in being also the cause of the continued growth of tumours. Do the experiments, in their present state, necessarily bear this interpretation? The proof of the identity of these two agents does not seem to me quite clear.

As one who was concerned, chiefly on the administrative side, with the pioneer work of Mayneord, Hieger, Cook, and Hewett on carcinogenic compounds, I am very glad that methylcholanthrene has performed the humble, and essential, part of initiating the growth of one of the tumours used by Gye, and I am sure that Professor J. W. Cook, to whom we owe the existence of this compound, would agree.

The distinction between the initial and the continuing cause of cancer suggests many attractive speculations. For instance, one would like to know what was the first abnormal change in the fowl which produced the Chicken Sarcoma I of Murphy and Rous. What determines whether a wild cottontail rabbit does or does not develop a Shope tumour? Why is sarcoma a very rare spontaneous tumour in the mouse, the species in which this new agent has been discovered? Why are certain compounds carcinogenic or, as one might say, able to liberate a virus, while other closely allied compounds have not this power?

One hopes that Professor Gye and his staff will go on to test filtrates of these tumours. Dr. L. D. Parsons has recorded the production of sarcomas by filtrates of sarcomas of the mouse induced, as was one of the three used by Gye, by a hydrocarbon (a derivative of 1:2:5:6-dibenzanthracene). Preliminary statements of her work, which was interrupted, were given in the 12th to the 17th Annual Reports of the British Empire Cancer Campaign and elsewhere.[1,2]

In the same issue of the *British Medical Journal* the author of a leading article (p. 531) states, "Suppose . . . we can safely accept the conclusion that tumours in general can be propagated in the absence of viable tumour cells, where does this lead? . . . It means that of current theories of the nature of cancer some 90% can be quietly relegated to the waste-paper basket. . . ." It would be interesting to know what are, say, nine of these theories which are demolished by experiments upon some sarcomas of the mouse.

Those of us who have reached "cancer age," and are hoping to avoid cancer altogether, are naturally more interested in the initial cause of cancer than in the continuing cause. The results described by Professor Gye should assist discrimination between these two effects.—I am, etc.,

St. Bartholomew's Hospital, London, E.C.1. E. L. KENNAWAY.

REFERENCES
[1] *Nature*, 1938, **142**, 480.
[2] *J. Path. Bact.*, 1938, **47**, 501.

The Lethal Danger of Desoxycortone Overdosage

SIR,—Although I have written fully on this subject in Price's *Practice of Medicine*, Hutchison's *Index of Treatment*, *Major Endocrine Disorders*, etc., I have met with three cases in undergraduate and postgraduate centres in the last few months and feel called upon to make a further note.

Desoxycortone is used in Addison's disease and Simmonds's disease because it is an easily administered essential hormone of the adrenal cortex, affecting salt and water metabolism but not carbohydrate metabolism. Overdosage results in excessive

retention of salt and water and excessive excretion of potassium, with resulting low serum potassium values. There may be obvious oedema of superficial tissues, with or without hypertension; or more insidious pulmonary oedema, going on to general anasarca; or the paralytic effects of low potassium concentrations may be presenting features. (I do not include the occasional production of more chronic hypertension without any fluid retention or depression of potassium.) With injection treatment, an awareness of the possibility of overdosage permits its avoidance or easy correction by diminishing or withdrawing the desoxycortone injections. However, the facility of and patients' preference for subcutaneous implantation of tablets has led to the increasing use of this method, and here the only really reliable method of counteracting overdosage through wrong calculation is by removal of some or all of the tablets—a procedure which is not as easy as their implantation. Temporary corrective measures are the use of diuretics—e.g., mersalyl, urea; and potassium citrate by mouth if the serum potassium is known to be low.

In December, 1938, I made the first report on Addison's disease (four cases) treated with implantations of desoxycortone acetate.[1] The dose I chose, rather empirically, was 200 mg. for the initial implantation. Although my subsequent arithmetical formula was rather higher—one 100 mg. tablet for each 1 mg. of desoxycortone injected daily, giving an implantation of some 400 mg. for the average case—I am tending to return to 200 mg. as an initial implantation. Thorn and his colleagues[2 3] suggested the rather high equivalent of 100 mg. for each 0.5 mg. of desoxycortone injected daily. The use of this high equivalent has undoubtedly led to overdosage by the implantation method in other clinics, although Thorn is careful to point out that the maintenance dose after several weeks or more is less than the initial maintenance dose. Even so, this equivalent is, I believe, still too high, and for initial implantation probably twice as high as is prudent over a series of cases.

In a recent case of overdosage two separate implantations of 200 mg. each at intervals of seven months were successful, whereas a third of 300 mg. led to oedema and depression of serum potassium. Some patients, in the case of both Addison's and Simmonds's disease, are particularly sensitive to desoxycortone, and this sensitivity may vary. Certainly no patient should have an initial implantation of desoxycortone before a trial period of several weeks with desoxycortone injections. Some patients who have their mineral metabolism well balanced (as judged by chemical estimation) by desoxycortone implantations nevertheless may be liable to chronic hypoglycaemia, with hypoglycaemic exacerbations which may prove fatal, and this should be looked for and anticipated. It should also be remembered that cortical extract (e.g., "eucortone," "eschatin"), although much safer than desoxycortone from the point of view of excessive salt and water retention, can in large doses produce or aggravate it. A further point is that if testosterone is implanted as supplementary therapy with the desoxycortone the dose of the latter must be less, as testosterone has a salt and water retaining effect and may tip the scales in the wrong direction. Of course, supplementary salt by mouth is another aggravating or reinforcing factor when the dose of desoxycortone is on the high side.

The justification for this letter is the not infrequent occurrence of overdosage effects from desoxycortone—grave or even lethal—some ten years after initial experience with this valuable and highly potent form of therapy.—I am, etc.,

S. L. SIMPSON.

London, W.1.

REFERENCES

1 *Proc. R. Soc. Med.*, 1938, **32**, 685.
2 *J. Amer. med. Ass.*, 1940, **114**, 2517.
3 *J. clin. Endocrinol.*, 1943, **3**, 335.

Statistics and Health Education

SIR,—You report (*Supplement*, March 26, p. 160) that the Ministry of National Insurance is about to collect some more statistics (about illness) and that the public health department of the Middlesex County Council has been holding a discussion on the strategy of health education (March 26, p. 538). Now presumably the objects of both these activities are the same—to improve the health of the people—but are either of them using the best approach? The Ministry, according to your leading article (p. 533), is asking, "How often are we ill?" (Without a single extra page of statistics, do we not already know the answer? Too often.) It is, however, also collecting much information about age groups, marital status, etc., and it says that the validity of the statistics will depend on the accuracy of the diagnosis as stated on the certificate. In other words it must be able to classify the "diseases" from which patients are suffering.

Now, Sir, if we want to get the right answer we must ask the right questions. If we want to keep people well, then surely the right question to ask is, "Why do they get ill?" and not, "What illness have they got?" After all, it is human beings who get ill, and disease is a metaphysical conception. What help is it to us to say precisely what illness the patient is suffering from if we do not know why he got ill? We have not finished when we have stuck a so-called diagnostic label on the patient—we are just at the beginning.

You have given the Middlesex discussion the subtitle "Telling the Public." Would not a better approach to the problem be "Asking the Public"? As Dr. Hill said, too little is known about the prevention of disease. Would it not be better to ask the patients about the circumstances which led to their illness rather than concentrating exclusively on the precise nature of that illness? If we did, is it not likely that we should learn something more about prevention? The Ministry presumably wants to find out something about why married women get ill so frequently. Why doesn't it ask my coalman? In his office he has a notice: "The wife works seven days a week—I work five." Suppose the Ministry were to ponder for a time on that notice and then ask itself, "Are our statistics really useful?" On the other hand, if Dr. Hartston did start "calling all lumbagos" (and got a reply from all neurotics) would he really be so sure exactly what to tell them to do to prevent further attacks? And would they really want to do it?

There is another question which has always intrigued me: In an epidemic of influenza, why does not everyone catch it? Do we know the answer, and would it not help us if we did? The trouble as I see it, Sir, is that only those of us have time to think who are removed from reality—that is, from general practice. (As the train bears me away to rural Sussex I can cogitate over the articles in your *Journal* in a way that was impossible when I was tearing back to do a surgery in south-west London.) The consequence is that attempts at preventive medicine are being made in a sort of vacuum—hence their ill-success.

An intelligent community that really wished to improve its health would put its best doctors into general practice and give them sufficient leisure to research into the problems of real life. It is doubtful whether we are an intelligent community, but is not this an opportunity for somebody—perhaps the Rockefeller Foundation—to subsidize a few selected general practitioners to do some research? We might then get some useful results.—I am, etc.,

F. GRAY.

East Hoathly, Sussex.

Hyperinsulinism Due to Islet-cell Adenoma

SIR,—As a mere student, I hesitate to trespass on the pages of the *Journal*. However, I feel it only just to point out that the historical summary prefacing Dr. W. G. Duncan Murray's article (March 26, p. 521) on islet-cell adenoma is not quite accurate in one respect. Dr. Murray states that the first operative cure for this condition was reported by Carr and his colleagues in 1931.[1] It is generally acknowledged in the literature that the first operative cure preceded this by two years, being reported by Howland, Campbell, Maltby, and Robinson in 1929.[2] This case was reviewed, together with three others, in 1939 by Campbell, Graham, and Robinson,[3] the patient being alive and well after ten years. Carr and his colleagues do in fact acknowledge this precedence in the preamble to their original paper. I hope this gentle reminder will not be taken for quibbling. It is rather important that this case should be remembered, as the follow-up is the longest recorded.—I am, etc.,

J. BRYAN EAGLES.

Manchester, 15.

REFERENCES

1 *J. Amer. med. Ass.*, 1931, **98**, 1363.
2 Ibid., 1929, **93**, 674.
3 *Amer. J. med. Sci.*, 1939, **198**, 445.

Delayed Admission to Hospital

SIR,—In your leading article (March 26, p. 532) two instances were given illustrating the difficulty which at present exists in gaining immediate admission for even acute surgical emergencies to hospital. But the circumstances differed considerably in the two cases you quoted.

The first, that of a patient with tuberculosis who developed a superimposed and presumably non-tubercular condition, belongs to a problem group which most certainly existed long before the appointed day. In the past there was the same difficulty in accommodating the acute case who in addition had open tuberculosis. Sanatoria, if perchance there was a vacant bed, often had no facilities for operative treatment. General hospitals, on the other hand, were loath to admit cases of open tuberculosis to their wards, and some hospitals had a regulation that such cases should not be admitted. The solution to this problem would be to reserve in each area a number of beds, and a very small number would suffice, at one hospital where facilities exist both for emergency (i.e., operative) treatment and for isolation of the patient.

The second case you described revealed an even more serious state of affairs. As stated later in your article, " . . . before July, 1948, any hospital, however hard-pressed, always managed to find room for someone in need of life-saving medical or surgical treatment." I cannot believe that the refusal of such emergencies is a common occurrence throughout the country. Certainly in the smaller towns with one, or at the most two, general hospitals the difficulty of gaining admission would not often arise. In such towns, even since July, 1948, the "individual" responsibility of the hospitals continues—it must, for there is no alternative.

The "group principle" will lead to a measure of better co-ordination between hospitals in some ways, but at the same time it inevitably weakens the sense of "individual responsibility," which now becomes diffused into "group responsibility." In view of the difficulties which the Emergency Bed Service is experiencing it might be wise to reconsider the proposed bed bureau in other regions.

Your article concluded by stressing the urgent need for the "quick re-establishment of authority to secure the immediate admission into a State hospital of an acutely ill person," but did not suggest who would wield such authority. Earlier you referred to the authority of the relieving officer under the Poor Law and Local Government Act. Surely it is not proposed that a similar authority should be re-established? Moreover, it was seldom that the relieving officer had to deal with the acute emergency; rather he requested admission for aged or chronically ill patients, and on grounds more often social than medical or surgical.

This raises yet another problem, and one which is common in all regions, the difficulty of providing sufficient accommodation for the aged requiring hospital treatment. A large percentage of the cases in the old poor law institutions which have now been taken over as State hospitals are ambulant and no longer in need of hospital treatment. If these cases could be found accommodation outside the hospitals, much-needed beds would immediately be available for the aged who require and are waiting for treatment. It almost seems that the authority to admit should in this instance be reversed to "the authority to discharge."

Local authorities have now been given the task of providing accommodation for the aged in need of care and attention. But, bereft of their institutions, hampered by covenants and restrictions in their efforts to convert existing large houses, and apparently without priority to build hostels, they have an unenviable task. Certainly it will take several years to provide the much-needed hostel accommodation. Until it is provided the waiting-lists of the aged and chronic sick will continue. The re-establishment of authority will not solve this problem.—I am, etc.,

Nottingham. WILLIAM MORTON.

SIR,—If only to stress the importance of your leading article (March 26, p. 532) I wish to record a recent experience. While acting as locum to a doctor in X, I recently saw on a Saturday morning a boy aged 3 years—in his third week of whooping-cough—suffering from acute appendicitis. I rang up Hospital A, who stated that they had no accommodation for a case of infectious disease and referred me to Hospital B, where there are cubicles. On requesting the child's admission, I was told that there was no bed. On my inquiring for the emergency bed service I was informed that no official was present—it then being after 12 noon. I then tried Hospital C, where I again drew a blank. Finally I telephoned Hospital B again, and it was not until I suggested ringing up the Ministry of Health that a bed was found.

The child was operated on the same afternoon and the appendix was found to be gangrenous. The patient is now at home convalescing. Had I not persisted in my demand for a bed I have little doubt that the boy would have died. An emergency service that does not function between noon on Saturday and 9 a.m. on Monday is a farce.—I am, etc.,

M. B. REICHWALD.

Diagnosis of Early Pulmonary Tuberculosis

SIR,—Many experienced general practitioners will agree with Dr. Reginald Fisher (April 2, p. 591) that the selection of patients to be referred to the local tuberculosis officer is no easy matter, and there can be no doubt that the great majority of tuberculosis clinics have neither the staff nor the other facilities for dealing with all those who should be referred to them.

It was in order to meet this difficulty that in January, 1948, a miniature radiography unit was installed at the Cardiff tuberculosis clinic, to which practitioners were invited to send any patient with symptoms of ill-health, not necessarily suggestive of pulmonary tuberculosis. Those with more definite symptoms were referred to the clinic in the usual way. This scheme has proved a success in Cardiff and has led to the discovery of a considerable number of early cases of tuberculosis as well as other chest diseases.—I am, etc.,

Cardiff. S. H. GRAHAM.

The Thymus in Meningococcal Septicaemia

SIR,—I think that Drs. Peter Turner and R. V. Dent (March 26, p. 524) will allow me to comment on the fleshy thymus glands which were found in their two post-mortem cases of meningococcal septicaemia. I am sure that it is a misinterpretation which leads them to state that "the rapid course of the illness makes it evident that the (thymic) enlargement preceded infection." On the contrary, the rapid course of the illness did not give the thymus gland time to undergo the gross involution which occurs during the course of any serious illness lasting more than a few days.

In Case 3, a girl of 15, the thymus, which is considered to be enlarged, weighed 42 g. This is well within the range of 13 to 50 g. given by Boyd[1] for the age group 10–15 years. The latter figures are based on forty cases within this age group in which death, resulting from violence, occurred within twenty-four hours. Histologically the thymus glands in Cases 1 and 3 appeared normal, and, in view of what I believe to be normal weights also, I see no evidence to suggest that the thymus plays any part in meningococcal septicaemia. In conclusion, may I quote from Boyd's paper a sentence which sums up the position admirably: "Since most subjects who come to autopsy have been ill for more than three days, the pathologist's eye becomes adjusted to the involuted thymuses, so that the prominent thymus of the healthy, well-nourished subject appears enlarged to him."—I am, etc.,

London, S.E.5. G. F. M. HALL.

REFERENCE

1 *Amer. J. Dis. Child.*, 1932, **43**, 1162.

Cough Fracture in Pregnancy

SIR,—In the light of the interest stimulated by the recent report of four cases by Drs. J. W. Paulley, D. H. Lees, and A. C. Pearson (Jan. 22, p. 135), the following case may be of interest.

A woman of 36, who had been delivered of her third child three days previously, was seen at home on April 29, 1948. She gave a history of recurrent bronchial attacks during the preceding two years. One week before confinement she developed a severe cough, and three days later a sharp pain of pleuritic type in the left chest, and a little fever. Her side was strapped, and the confinement

proceeded normally. I was asked to see her, in view of the possibility of a tuberculous infection and its immediate danger to the infant. On examination, she was afebrile and did not appear ill. Her chest contained a number of bronchial signs; she had relatively weak air entry on the left, and was rather tender over the left base, with the most sensitive spot below the left scapula.

A small portable *x*-ray machine was taken out to her cottage, which was fortunately supplied with electricity. The film was considered normal and the case proceeded favourably, although the pain persisted in the left chest for some time. A check-up *x* ray was done three months later, which showed callus formation on the left 7th and 8th ribs in the posterior axillary line. Reinspection of the original film showed a suspicious line at the site of the lesion in the 8th rib, and there seems no doubt that the onset of the original "pleurisy" was in fact occurrence of the fractures.

This case shows the features mentioned by Drs. Paulley, Lees, and Pearson—a chronic cough in late pregnancy causing a fracture of the lower ribs on the left. It also suggests that such cases may be missed by a routine chest radiograph, which does not readily demonstrate a recent fracture without displacement.

My thanks are due to Dr. I. Speedy Bertin for the clinical features, and to Mr. A. F. Keith for the radiography in difficult circumstances.—I am, etc.,

Exeter. G. E. ADKINS.

What is Normal?

SIR,—One of the early tasks of Dr. Clifford Allen's institute of psychosexual diseases (March 26, p. 547) should be the study of normal sexual behaviour. Kinsey has shown how ignorant we are of the conduct of normal people, and surely more work is needed along these lines, especially in this country, before we can really decide what is abnormal. For example, one might have been inclined to call homosexuality abnormal, but if Kinsey's statement that 37% of all American males have homosexual experience after adolescence (and more before) is true, that is hardly possible.

Having obtained a clearer idea of what is sex abnormality, one can then decide more rationally what should be regarded as sex delinquency, for abnormality and delinquency are quite distinct (homosexuality is probably not abnormal but certainly is illegal). The report of the joint committee of the B.M.A. and the Magistrates' Association (*Supplement*, March 12, p. 135) recommends an inquiry into the advisability of altering the law to allow homosexual conduct between consenting adults. But your comment (March 12, p. 446) that this and other proposals are "highly controversial," and that "many may think that any legal alterations which allow the actual or potential offender to think that law and order are weakening in his favour is inappropriate at a time when crime in general is becoming a grave menace to social security," is a little surprising. Surely homosexuality can hardly be regarded, along with, say, housebreaking, as a grave menace to social security? It is just such a comment as yours that makes one feel that it is so important to withdraw the term "criminal" from conduct which is essentially normal, and to restrict it to behaviour which involves another unwilling or under-age person.—I am, etc.,

London, S.W.4. DAVID PYKE.

Health Regulations for Air Travel

SIR,—I have to draw your attention to the article by Air Commodore J. Kyle (Dec. 25, 1948, p. 1115), which tabulates a list of requirements for travellers from England to places on the routes operated by the British Overseas Airways Corporation.

For passengers from Southampton to Hong Kong it is erroneously stated in the table referred to above that cholera and plague inoculation certificates are required. For your guidance I must add that in so far as Hong Kong is concerned cholera inoculation certificates are only required from passengers who originate or pass through ports declared infected with cholera by Hong Kong.

In so far as plague is concerned your attention is also invited to the World Health Organization weekly *fasciculus* (1948, 21, No. 15, p. 219), which contains the following passage: "The following information was received from the port health officer, Hong Kong, on April 2, 1948. (1) Ships and aircraft from ports declared infected against plague are subject to the following measures: Medical inspection, deratization of vessel or aircraft before and/or after discharge of cargo, if considered necessary after inspection of vessel or craft and its cargo. (2) Passengers from plague-infected ports are *not* required to produce inoculation certificates against plague."

I am therefore to request that you will be so good as to make this known to all concerned. I should add for your information that the local offices of all airlines operating from the United Kingdom to Hong Kong have been so informed.—I am, etc.,

Hong Kong. I. NEWTON, Director of Medical Services.

*** Air Commodore Kyle gives us the following information. An aircraft lands at airports in six or eight countries *en route* to the Far East, and if only one of these countries enforces quarantine restrictions all travellers going beyond the airport in that country must produce a certificate of inoculation either on the way out or on the way back. Air passengers to Hong Kong pass through Augusta, Alexandria, Bahrein, Karachi, Calcutta, Rangoon, and Bangkok. Of the two diseases referred to by Dr. Newton a certificate of inoculation against cholera is required at Bangkok from passengers who have passed through Calcutta and Rangoon on the outward journey; and a certificate of inoculation against plague is required on the homeward journey at Alexandria for passengers who have come from or passed through Bangkok.—ED., *B.M.J.*

Vesico-vaginal Fistula

SIR,—As none of your readers have responded to the invitation of Dr. D. T. R. Evans (March 12, p. 455) for information regarding the demonstration of the site of vesico-vaginal fistula by the injection of air, may I recount my experience in connexion with a similar problem.

About the year 1903, when I was trying to make myself familiar with the use of the cystoscope, I set out to demonstrate the site of a vesico-intestinal fistula. I imagined that this could easily be done by injecting coloured fluid into the rectum and observing it flowing through the fistula into the bladder, but soon found that this was fallacious and that the necessary information could not be obtained by this means.

During the examination air was unintentionally pumped into the rectum from an empty Higginson's syringe and at once found its way through the fistula and bubbled into the solution in the bladder, disclosing the site of the fistula and proving a most satisfactory method of localization. Since that time I have every now and again employed the method and can recommend it as being simple and valuable.—I am, etc.,

Taplow, Bucks. G. GREY TURNER.

Observation of Children's Hearts

SIR,—I was glad to read Dr. R. Kemball Price's study (March 26, p. 515) of 200 cases of heart disease in children started in his cardiac clinic 18 months ago. Each case was examined clinically and by electrocardiogram and by cardioscopy, so that five cases occupied an afternoon. This is excellent as a research method, but in 1941 I advocated[1] a long-term plan by which in each routine school medical examination the heart angle was measured in every child. This can be done in two minutes, as only a tape measure is needed. The angle should remain constant throughout school life; if not, the cause of its increase must be sought (for prophylaxis) in valvular defect, rheumatic or other infections, athletic strain, or emotional stress. Unfortunately, in wartime none of the heart angles in my paper could be measured again in the following years; a long-term series is badly wanted.

If the apex beat moves outwards the heart is enlarged or distressed, but this linear distance increases as the child grows. Hence I measured it as an angle which does not change with growth. The simple method is to call the mid-sternum 0° and the mid-axilla 90° (one-quarter of the chest girth). In health the heart angle, measured from the left margin of the apex beat, should not exceed 45° in a child or adult. For instance, if the chest girth is 36 in. (90 cm.) the mid-axilla is 36+4—i.e., 90°—and the apex beat should not be more than 4.5 in.

11.25 cm.)—i.e., 45°—from the midline. Thus the heart angle is the apex beat distance divided by the mid-axilla distance multiplied by 90°. Calculations can be saved by the chart in my paper, or by better ones obtained at H. K. Lewis and Co., Gower Street, London, W.C.1, or I can send my reprints.

An enlarged heart angle is a clinical abnormality with a cause which demands treatment. It may or may not indicate an enlarged heart. Thus in effort syndrome I have always found the angle increased, but a teleradiograph shows no enlargement. This instructive discrepancy is mysterious, but Darwin long ago remarked that "in fear the heart knocks against the ribs"—owing to its emotional, slapping overaction.

I earnestly hope that doctors who examine children regularly, especially in boarding schools, will keep long-term records of the heart angle both in sickness and in health. I am confident that the results will be rewarding at the time and especially valuable when published after two or three years. Clinical reports are always far more instructive when the fourth dimension (time) completes them—as in my paper and as Dr. Price plans to do in greater detail.—I am, etc.,

Beverley, Yorks. F. C. EVE.

REFERENCE

1 *Lancet*, 1941, 1, 659.

Nurses and Nursing Aides

SIR,—It is quite clear that if the sick are to be nursed in hospital this cannot be done by a limited number of highly trained persons, however devoted and competent they may be. The opportunities open to academically gifted young women, especially in teaching and the social services, are now so numerous that we can no longer expect to obtain anything like an adequate number of them for nursing. We must therefore adopt measures on the lines suggested in the paper of Dr. E. B. Brooke and Mr. J. P. Wetenhall (March 19, p. 491); nor do I think that the profession of nursing will in any way suffer from this, but it will, I believe, gain increased recognition and prestige.

It is essential, however, that the ancillary worker—nursing aide or whatever her designation may be—shall be given a status and dignity in accordance with the important social duties she is carrying out. She must, as your contributors state, be in alignment with the ward nursing team. She must not come to be regarded as a nurse's menial or orderly. The rough-and-ready suggested division of nurses' duties between those ministering to the patients' comfort and those assisting the doctor is not sufficient for this purpose, nor, I imagine, was this intended.

We are at present considering the problem of "breaking down" nursing duties, much as has been done for many industrial processes; and we hope, with the guidance of experts in such problems, to be able to reach such a division as will leave with the ancillary worker such real nursing duties as will enable her to be emotionally satisfied and not frustrated by prohibitions (this is a vital matter), and also to make her help of value to the fully trained nurses, so that the two groups can work in the wards alongside each other, respecting and respected.

There will, of course, be difficulties in doing this, but it is to be hoped that the nursing authorities will recognize the urgent need for some such scheme and will make no difficulties about supporting it on the supposition that the status of the trained nurse will suffer. It will, in fact, be enhanced, and the sick will have some chance of being "nursed" in hospital instead of, as is too often the case at present, being "attended to as far as possible" at home.—I am, etc.,

St. Albans. W. J. T. KIMBER.

Taking Children's Temperatures

SIR,—May I round off this topic with a few comments? Some of your correspondents have disagreed with the contention of my letter (Dec. 18, 1948, p. 1078) and of Dr. A. Cyril Wilson's (Feb. 12, p. 284) that there are objections to the routine use of rectal thermometers for young children.

Dr. Lise Gellner (March 26, p. 547) dismisses with "amusement" the belief that early events such as this may later cause psychiatric disorders, apparently holding as proof the fact that Continental mothers all interfere with their babies in this way. Yet there was a time when Continental mothers as well as English ones cheerfully fed children upon rachitic diets, quite unaware of subsequent eventualities. The risk of disturbing a growing personality is no less serious than the risk of disturbing bony development.

Dr. A. A. MacDougall (March 12, p. 457) does not see that it interferes more to put a thermometer into the rectum than into the mouth or axilla. But it is natural for objects to go into the mouth, not into the rectum. I doubt he would maintain this standard had he seen children from a "modern" school playing "doctors" with imaginary rectal thermometers. Children can be consistent. Nor can I agree with him that vaginismus appears only in the psychopath. Out of 159 consecutive cases of vaginismus (most of them severe, being sent in consultation) no less than 56 actually remember that rectal interference was *de rigueur* in the nursery. Such a proportion is not likely to be chance; and I think others dealing with these cases should find a similar percentage, particularly if they remember to enquire about local treatment for threadworms or can ask the mother about soap-sticks in infancy.

Whilst no one suggests that the majority of children so treated suffer ill consequences, clearly one cannot foretell when lasting impressions may occur. During this correspondence I have had personal letters from psychiatrists and others confirming these views. I therefore still maintain that those in charge of infants' wards should not consider that rectal interference is necessarily a trivial or a harmless practice.—I am, etc.,

London, N.W.1. JOAN MALLESON.

POINTS FROM LETTERS

Is Influenza Epidemic?

Dr. A. H. GREGSON (Cromer) writes: With reference to the annotation entitled "Is Influenza Epidemic?" (March 12, p. 448), I apologize for the dogmatism of the following, but it is a purely clinical observation. There seems little doubt that the present influenza epidemic consists of three separate types—(1) and (2) harmless, (3) potentially fatal. (1) The patient presents with aching in the limbs and nausea, with a temperature of up to 100° F. (37.8° C.) and perhaps headache and vomiting. This responds in a few hours to intestinal antiseptics such as benzyl benzoate, or iodochlorhydroxyquinoline 0.25 g. thrice daily. (2) "Classical" influenza, with aching limbs, head, and trunk, some photophobia, pyrexia to 103° F. (39.4° C.), and no chest signs. This can be treated according to taste. (3) A dangerous "bronchial" influenza, which is really a bacillary bronchopneumonia plus aching limbs, head, and trunk, temperature of 99°–103° F. (37.2°–39.4° C.), and very often a true vertigo of labyrinthine type but not often showing nystagmus. In its early stages this type may not on superficial examination show any such signs, but the following test, first described I think by Hughes in 1842 (*Guy's Hosp. Rep.*, 1842, 7, 298) settles the matter: "The patient gives a forcible cough and an immediate deep inspiration through the *open* mouth. At the end of inspiration there is a mixed 'whiffling' sound with momentary bronchial breathing and sometimes a few momentary rhonchi." In my own experience of this test over some years a faint "plop" at the end of the forced inspiration is an even earlier sign. Either result means the same thing—incipient broncho- or lobar pneumonia.

Psychiatric Indications for Abortion

Dr. A. HARGREAVES (Rickmansworth, Herts) writes: In the letter of Dr. Ellis Stungo (April 2, p. 591) it is stated in reference to the psychiatric indications for abortion, "Obviously they have no football pools in Switzerland." This is incorrect. There is a well-organized pool, the surplus from which is devoted to the benefit of athletic and sporting organizations. . . . Whether this detail affects the validity of his argument I am not sufficient of a psycho-gynaeco-economist to determine.

Diagnosis of Early Pulmonary Tuberculosis

Dr. E. A. WOOD (St. Leonards-on-Sea, Sussex) writes: I sympathize with Dr. Reginald Fisher (April 2, p. 591), and perhaps my suggestions as to which patients to examine by *x* rays, briefly reported in the *Journal* of Sept. 27, 1947 (p. 487), will be more helpful. He will not forget, I am sure, to have sputum examined when there is any; though a "negative" should not preclude *x*-ray examination indicated on other grounds.

Obituary

Dr. WALTER WYNNE died at Northiam, Sussex, on March 7 at the age of 81. He was born at Ruthin, North Wales, in May, 1867, and received his medical education in Edinburgh, graduating M.B., C.M. in 1888. In the early 'nineties he started practice at Northiam, and remained there for the rest of his life, retiring in 1934. Dr. Wynne was a fine type of general practitioner and was much loved and respected over the wide area of his practice. He was fond of shooting, fishing, cricket, tennis, and all country things, and he had a great sense of humour. In 1935, following the shock of the death of their younger daughter after an operation, Mrs. Wynne and he went on the world tour arranged in connexion with the B.M.A. meeting in Melbourne. He took an active part in all the scientific and social aspects of the tour. Not long after his return he had a further blow in the death of his younger son. For many months Dr. Wynne suffered from a distressing paralytic condition, which he bore with great fortitude, only taking to his bed on the day of his death. The sympathy of his colleagues and friends will be extended to his widow and to his surviving daughter and son.—G. L. B.

Dr. ROBERT TENNANT BRUCE died on March 14 after a painful illness lasting more than a year, borne with quiet and uncomplaining fortitude. He was born in 1872 in Edinburgh, the son of the late Dr. Robert Bruce. Educated at Edinburgh Academy and Edinburgh University, he graduated M.B., C.M. in 1894, and after an assistantship in general practice he joined the late Dr. .Gowans as a junior partner at Broughty Ferry, Angus. A few years later he came to London, and in 1903 he proceeded M.D. He then practised at Thame, Oxfordshire, where his skill and kindliness soon became well known. In 1914 he joined the R.A.M.C. and served with a field ambulance in the 51st Division in France. Later he did a spell of duty as a regimental medical officer, and was taken prisoner. Later still, after his release, he commanded an ambulance train in France. After being demobilized he retired from practice and settled in London, where he was able to indulge in his many hobbies—climbing, travel, literature, carpentry, photography, chess, bridge, and croquet. In 1903 he married Caroline Taylor, daughter of David Wybrants, of Dundee, who survives him; to her the sympathy of Robert Bruce's innumerable friends will be extended.

Dr. PHILIP NEWMAN GRINLING died at his home in Sheffield on March 14 at the age of 41. He graduated M.B., B.S. at Armstrong College, Durham, in 1930, and was soon afterwards appointed house-surgeon and later house-physician to the Royal Victoria Infirmary at Newcastle-upon-Tyne. Following a period as an assistant he settled in general practice in the Firth Park district of Sheffield. There he rapidly built up a large practice which he conducted for the rest of his brief life. He was remarkably successful in the new sphere of industrial medicine, in which he had a niche of his own, particularly with the largest steel concern in Sheffield. He gave a great deal of time and energy to the St. John Ambulance Association. If he thought anything worth doing at all he expended all he had in him upon it, otherwise he left it alone. He was a member of all the important local B.M.A. committees in turn, and was secretary of the local public relations committee and a member of the Yorkshire Branch council. He never sought popularity, and in fact was courageous in his defence of unpopular issues and his lack of tolerance for any form of muddled thinking. Yet as a friend he was ever kindly and true as steel. It was painful for those who were his friends to see him struggling in recent years, when a never robust constitution was letting him down badly. We shall miss him greatly.—W. E. D.

The Services

Colonels (Honorary Brigadiers) F. R. Sandford, C.B.E., M.C., T.D., and G. J. V. Crosby, C.B.E., T.D., R.A.M.C., T.A., have been appointed Honorary Physicians to the King, in succession to Colonels H. F. Humphreys, O.B.E., M.C., T.D., retired, and R. Errington, C.B.E., M.C., T.D., retired.

Surgeon Commander G. A. Mason and Surgeon Lieutenant-Commander C. P. Nicholas, R.N.V.R., have been awarded the R.N.V.R. Decoration.

Medico-Legal

DANGEROUS DRUGS IN CARS

The case is reported[1] of a doctor who was fined £5 for failing to keep dangerous drugs in a locked receptacle. They were left in his locked car, which was stolen. When the case was heard on March 11 the prosecution did not dispute that the car was locked; it was stolen from the municipal car park while the doctor was at the cinema. When it was recovered, contended the prosecution, an open leather case containing drugs was found on the rear seat. Counsel for the defence disputed the view that a locked car is not a receptacle and said that if the prosecution's contention was upheld it would put the whole medical profession in a most difficult position. The stipendiary magistrate, Lord Ilkeston, said in his judgment: "In my opinion a locked car is not a receptacle within the meaning of the word as used in paragraph 4 (2) of the Dangerous Drugs Regulations, 1948." He agreed to state a case.

When the Dangerous Drugs Regulations, 1948, were published a Home Office notice accompanying them[2] stated that the Secretary of State is advised that a car cannot be regarded as a receptacle. The law is uncertain on how a doctor may leave dangerous drugs in an unattended car. It would seem to be necessary for him to lock both the car and the case in which the drugs are kept. Probably the locked case would be regarded as a proper receptacle and the locked car as a proper place for the receptacle to be kept, though it is uncertain what view the courts would take of this. To be on the safe side doctors would be well advised to attach the case to the car by means of a padlock and chain, and leave the car locked. It is insufficient precaution to leave a locked case in an unlocked car.

[1] *Daily Telegraph*, March 12, 1949.
[2] *British Medical Journal*, 1949, **1**, 78.

Universities and Colleges

UNIVERSITY OF ABERDEEN

At a Graduation Ceremony on March 31 the following medical degrees were conferred:

M.D.—[1]R. G. Simpson, [2]G. Sangster, P. H. Beattie.
M.B., Ch.B.—A. R. Adams, Mary P. H. Lewis, A. Nicol, N. A. Regan, Joan E. Smith, R. F. P. Steven, J. A. Tallack.

[1] With honours for thesis. [2] With commendation for thesis.

UNIVERSITY OF EDINBURGH

Dr. Douglas Guthrie, Lecturer on the History of Medicine, will deliver a series of lectures entitled "The Historical Approach to Medicine" in the Physiology Lecture Theatre, University New Buildings, Teviot Place, Edinburgh, on May 2, 9, 16, 27, and 30 and June 6, 13, and 20, at 5 p.m. The course is open to all matriculated students and graduates of the University, and to members of the University staff, without fee. Others may attend on payment of an entrance fee of 10s. in lieu of the matriculation fee.

UNIVERSITY OF LONDON

The degree of D.Sc. has been conferred on Frederick Robert Selbie, Ph.D., M.D., Reader in Bacteriology at Middlesex Hospital Medical School.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

The following have been admitted Fellows of Faculty *qua* Physician: J. F. Smith, M.D., R. A. Blair, M.B., J. Crorie, M.B., S. K. Ganguli, M.B., G. H. V. Keshani, M.B., Margaret M. O'Hare, M.B., C. M. Ross, M.B., I. A. Short, M.B., Mary D. Smith, M.B., R. A. Y. Stewart, M.B., F. H. Stone, M.B., W. O. G. Taylor, M.B., R. M. Thomson, M.B., J. D. Woods, M.B.

The following have been admitted Fellows of Faculty *qua* Surgeon: A. A. Bonar, M.B., E. Cameron, M.B., R. K. Dewar, M.C.P.&S.Ont., J. Ferrier, M.B., J. D. Fraser, M.B., T. B. Gardiner, M.B., J. M. Jalundhwala, M.B., G. Johnstone, L.R.C.P.&S.Ed., M. T. Khaleeli, M.B., D. MacLeod, M.B., D. A. Macpherson, M.B., A. L. Morton, M.B., J. F. P. Mullins, M.B., R. M. Nadkarni, M.B., T. R. A. Richmond, M.B., N. T. Sampanthan, M.B., M. Shaw, M.B., R. N. Sinha, M.B., G. Smith, M.B.E., M.B., R. A. Tennent, M.B.E., M.B., J. K. Watt, M.B.

ROYAL COLLEGE OF SURGEONS IN IRELAND

The following candidates received the Fellowship of the College on April 1, having passed the examination on March 10: J. S. Martin, M. S. Strong, J. C. de R. Sugars.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council, held in the College House on March 26, with the President, Sir William Gilliatt, in the chair, Miss Josephine Barnes was appointed to serve on the Population Investigation Committee of the Eugenics Society. Mr. R. C. Thomas was appointed to represent the College on the Council of the Queen's Institute of District Nursing.

Harold Renton (South Africa) was elected to the Membership.

The following were elected to the Fellowship: Doris C. Bates, R. B. Charlton, K. M. K. Duff, M. D. A. Evans, J. D. S. Flew, R. Gilbert, J. W. Johnstone, W. I. C. Morris, Margaret M. Nolan, H. L. Sheehan, D. F. Standing, C. K. Vartan, W. Waddell, W. W. Wilson, R. G. Worcester.

A prize for an essay on the "Physiology or Management of the Third Stage of Labour" was divided between Dr. Jean R. C. Burton-Brown (Oxford) and Dr. David A. Fletcher Shaw (Manchester).

Medical Notes in Parliament

Analgesia in Childbirth

Lady TWEEDSMUIR asked Mr. Bevan on March 31 at what date he asked the Medical Research Council to solve, as quickly as possible, the problem of finding a safe and effective analgesic agent for midwifery.

Mr. BEVAN replied that there was no need to make that request, because the Medical Research Council, as he was aware, took into consideration the recommendation made in this matter by the Working Party on Midwives and had decided to set up a committee in accordance with that recommendation. He hoped that before long a much cheaper and more easily transportable apparatus would be produced. That would not be allowed to interfere with provision of transport for midwives, which was proceeding at an accelerated rate. He had impressed on local authorities that they should not delay provision of apparatus in the hope that a lighter apparatus would become available.

Dr. SEGAL asked what was the lowest cost of apparatus for the administration of trilene analgesia in obstetrics.

Mr. BEVAN answered that there were several types of apparatus, all of which were portable. The lowest price of the types on the market was, he understood, about £7. The suitability of existing apparatus for use by midwives in domiciliary cases would be among the matters investigated by the expert committee appointed by the Medical Research Council. It was not yet certain that it was safe for midwives to use the trilene apparatus without assistance.

Replying to Mr. PETER THORNEYCROFT, Mr. BEVAN said there were eight county or county borough councils in whose areas no analgesia was being used in the domiciliary midwifery service. They were: Merioneth County and the county boroughs of Bath, Burnley, Chester, Dudley, Merthyr Tydfil, Nottingham, and St. Helens.

Mr. WOODBURN said on April 5 that expert medical opinion was not yet agreed on the unsupervised use by midwives of any existing trilene apparatus. The Medical Research Council had decided to set up a committee to investigate the problem.

Mr. BEVAN on April 7 told Lady TWEEDSMUIR that he could not yet say when he would receive the final recommendations of the Medical Research Council on the latest types of analgesic drugs and apparatus suitable for use by midwives alone. Although existing methods would no doubt be reviewed by the committee which had been set up, the question remitted to the Medical Research Council by the Working Party on Midwives was on the possibility of devising improved methods. This was a relatively long-term project involving the initiation and conduct of actual research work. Quick results were not to be expected.

Number of Patients

Mr. BOSSOM asked on March 31 what estimate Mr. Bevan had made for the purposes of the National Health Service of the number of patients which a doctor could reasonably be expected to see in a day or an hour.

Mr. BEVAN said the number of patients a doctor could attend varied according to the circumstances of his practice. No precise estimate was possible. The figure of 4,000 was the maximum which the British Medical Association agreed that any doctor should have upon his list, but there were doctors with lists of 4,000 who had fewer patients to attend than had some doctors with a list of only 3,000. In parts of the country where the average age of the population was high, a higher percentage of people would need to see the doctor.

Beds for Emergency Cases

Dr. SEGAL on March 31 asked Mr. Bevan to arrange for at least one bed for the admission of emergency cases to be reserved nightly in all hospitals of over 200 beds.

Mr. BEVAN would not do this. He said hospitals normally reserved the number of beds shown by experience to be needed, and in emergency put up extra beds. There was more demand for beds to-day and many more beds to meet the demand.

Sir HENRY MORRIS JONES said that before the Health Service Act came into force no hospital in London or elsewhere refused emergency sick cases. Was Mr. Bevan aware that, in London particularly, medical men had to be on the telephone for over an hour every day trying to get sick people into hospital?

Mr. BEVAN said Sir Henry was inaccurate. Before the passage of the Act it was often difficult to get emergency cases into hospital. There was now fixed responsibility. Formerly responsibility was diffused and no one knew about the complaints. All vacant beds in London were filled up nowadays by the end of the day. Where there were emergency cases, emergency beds were established in order to deal with them. There would inevitably be instances of delay, but the Ministry would try to cut the delay down.

N.H.S. Locums

Mr. BEVAN on April 7 told Sir WALDRON SMITHERS that he would not take steps to pay for a locumtenent when a doctor in the National Health Service was ill or incapacitated. He added that in fixing the remuneration of general medical practitioners full account was taken of practice expenses. The cost of employing a locumtenent where necessary formed part of these expenses.

Hospital Staff and Beds

Asked by Dr. BROUGHTON on April 7 what increase there had been in the number of staffed beds for the acute sick in general hospitals in England and Wales since the date of the coming into operation of the National Health Service Act, Mr. BEVAN replied that figures for beds for the acute sick as such were not readily available. Between June 30 and Dec. 31, 1948, the increase in the number of staffed beds in general hospitals in England and Wales was 15,510.

Maternity Packs and Dressings

Dr. COMYNS on April 7 asked where expectant mothers attending antenatal clinics should obtain maternity packs and dressings for the lying-in period.

Mr. BEVAN said local health authorities should arrange for maternity outfits for domiciliary confinements to be supplied at clinics, through midwives, or in some other convenient way, and for other dressings required during the lying-in period to be provided by the midwife in attendance. Maternity outfits and sterilized dressings were not included in the schedule of appliances which a general practitioner could prescribe for his National Health Service patients.

Vitamins in Bread

Mr. STRACHEY, replying to Dr. BARNETT STROSS on April 4, said that there was no vitamin A in bread. The comparative figures for the vitamin B_1, B_2, and calcium of the national and pre-war white bread were (in milligrams per oz.):

	National	*White*
Vitamin B_1	0.063	0.015
Vitamin B_2	0.028	0.013
Calcium	31	3

During the past four years the rate of extraction of national flour has varied between 80% and 90%. The current rate of extraction is 85%. National flour is reinforced with calcium (creta preparata) at the rate of 14 oz. per 280 lb.

Streptomycin.—Mr. BEVAN said on March 31 that the production of streptomycin was now sufficient to cover all medical needs and to provide small but increasing quantities for export. Further expansion was planned. Since July, 1948, the number of hospitals in England and Wales where streptomycin treatment was available had increased from 30 to 220.

No. 12

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 26.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1949 (a)	(b)	(c)	(d)	(e)	1948 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	39	4	15	3	3	53	5	8	1	3
Deaths		1	1				—	—		
Diphtheria	117	13	40	6	5	154	13	46	10	2
Deaths	1	—	—	—	—	3	—	1	—	—
Dysentery	34	7	26	1	—	136	10	53	1	1
Deaths				—	—				—	—
Encephalitis lethargica, acute	1	—	—	—	—	1	—	—	—	—
Deaths		—					—			
Erysipelas			27	11	1			40	5	3
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				36					25	
Deaths	35	3	4	3	6	44	4	9	3	2
Measles*	15,307	1274	340	118	178	9,308	1425	369	99	48
Deaths†			1	1	—			3	—	—
Ophthalmia neonatorum	47	9	7	—	1	38	4	8	—	—
Deaths										
Paratyphoid fever	7	—	—	—	—	1	—	1(B)	—	—
Deaths	—	—	—	—	—	—	—	—	1	—
Pneumonia, influenzal	1,547	65	19	12	8	720	44	6	5	6
Deaths (from influenza)‡	327	26	9	2	3	14	—	3	—	3
Pneumonia, primary			242	48				226	29	
Deaths	444	62		9	16	242	44		12	9
Polio-encephalitis, acute	2	—				1	—			
Deaths										
Poliomyelitis, acute	15	2	3	1	—	17	3	1	—	—
Deaths§	1	—				2	—			
Puerperal fever		—	4				—	11		—
Deaths										
Puerperal pyrexia‖	99	9	6	2	—	103	12	14	1	—
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,357	105	173	100	44	1,526	97	261	36	39
Deaths†			—	—	—					
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	3	—	—	1	—	4	—	1	7	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	2,978	181	244	122	68	2,603	192	50	45	16
Deaths	9	1	7	2	—	13	2	1	—	—
Deaths (0–1 year) Infant mortality rate (per 1,000 live births)	359	48	51	22	21	306	37	58	19	9
Deaths (excluding stillbirths)	6,847	971	680	187	187	4,704	705	601	179	109
Annual death rate (per 1,000 persons living)			13·6	11·2				12·1	11·2	
Live births	8,444	1336	974	415	256	7,663	1195	963	411	233
Annual rate per 1,000 persons living			19·5	25·7				19·4	25·7	
Stillbirths	206	32	32			194	26	32		
Rate per 1,000 total births (including stillborn)			32					32		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales, Eire, and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Infant Mortality, Stillbirths, and Abortions

A quarter of a million, or 1 in 8, of the children that might have resulted from two million pregnancies in the three years 1936–8 were lost as a result of spontaneous abortion, stillbirth, or death in the first twelve months of life. This estimate was made by Titmuss and quoted by the Joint Committee of the Royal College of Obstetricians and Gynaecologists and the British Paediatric Association in the report, *Neonatal Mortality and Morbidity*, discussed in a recent leading article (*Journal*, March 12, p. 444). This figure of 250,000 is so striking that it seemed of interest to examine it. During the three years there were 1,837,053 live births. The losses included 74,580 stillbirths, 103,324 deaths of infants under 1 year of age, and, according to Titmuss, 90,000 abortions, excluding criminal abortions. Titmuss did not give the details on which his estimate of abortions was based nor did he indicate whether this figure was really representative of the whole population. Consequently it is not clear whether this is a conservative estimate or not. However, the two official figures and the 90,000 estimate give a total loss of 267,904 infants or potential infants—appreciably more than the quoted quarter of a million. If to this figure is added the known total of live births (1,837,053) the total pregnancies in the three years were just over the two-million mark—2,001,633. The proportion of pregnancies which yielded children who did not survive a year, on this basis, is 267,904 : 2,001,633, which would correspond to a rate of 134 per 1,000. Large as this rate may seem, the infant mortality alone exceeded this level at the beginning of the present century. Improvements have taken place in the ten years since 1936–8, and the figure of 1 in 8 has now been reduced to something of the order of 1 in 12.

Discussion of Table

In *England and Wales* there was a rise in the notifications of scarlet fever 148 and whooping-cough 188. There was a decrease in the incidence of measles 968 and cerebrospinal fever 18.

The largest rises in the incidence of scarlet fever were those of London 42, Surrey 30, and Lancashire 26. The chief variations in the notifications of whooping-cough were increases in Lancashire 90, Kent 36, and Middlesex 31, with decreases in London 40 and Oxford 23.

The largest falls in the notifications of measles were Yorkshire West Riding 206, Middlesex 188, Lancashire 166, Staffordshire 160, Essex 158, Yorkshire North Riding 121, Southampton 110, and Surrey 101. The only outstanding exception to the declining trend was a rise of 101 in Sussex. There was no appreciable change in the notifications of diphtheria.

Of the 34 cases of dysentery 15 were notified in Lancashire (Liverpool C.B. 9; Preston R.D. 4).

Deaths from influenza in the great towns were 33 fewer than in the preceding week. A small decline occurred in every area except in the Midland and North Midland region, where an increase of 21 was recorded.

In *Scotland* there were increases in the notifications of measles 48, dysentery 13, and diphtheria 12, while a decrease was reported for whooping-cough 28. The increase in the incidence of dysentery and diphtheria occurred in the western area; in Glasgow the increases were 5 and 12 respectively.

In *Eire* there were increases in the notifications of whooping-cough 65 and diarrhoea and enteritis 18, while a fall of 38 was reported for scarlet fever. The rise in the incidence of whooping-cough and diarrhoea and enteritis was mainly due to the experience of Dublin C.B. No further cases of scarlet fever were notified from the outbreak in Donegal, Stranolar R.D., where 31 cases were notified in the preceding week.

In *Northern Ireland* the largest change in the weekly totals was an increase of 10 in the notifications of measles.

Quarterly Returns for Scotland

The births during the December quarter were equivalent to a rate of 18.5, which was 0.2 below the average of the fourth quarters of the five preceding years. The infant mortality was 44 per 1,000 registered live births, the lowest rate ever recorded for a fourth quarter, and 13 below the rate for the fourth quarter of 1947. The general death rate of 12.2 per 1,000 was 0.6 below the five-years average. The death rate for the principal epidemic diseases was 8 per 100,000, compared with an average of 25 for the corresponding quarter of the five preceding years. The chief causes of death in this group were influenza 52, whooping-cough 20, cerebrospinal fever 12, and diphtheria 9. The death rate for all forms of tuberculosis was 74 per 100,000, and for respiratory tuberculosis 67. These rates are respectively 1 and 7 above the five-years average.

Week Ending April 2

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,257, whooping-cough 2,998, diphtheria 105, measles 15,819, acute pneumonia 1,481, cerebrospinal fever 30, acute poliomyelitis 13, dysentery 62, paratyphoid 2, and typhoid 1.

Medical News

Lord Boyd-Orr

Lord Boyd-Orr, formerly Director-General of the United Nations Food and Agriculture Organization, was made an Honorary Fellow of the Royal College of Physicians of Ireland on April 5.

Lord Addison

Viscount Addison has resigned his office as Paymaster-General. He retains his post as Lord Privy Seal, and continues to be Leader of the House of Lords. He is succeeded by Sir Gordon Macdonald, retiring governor of Newfoundland.

Broadmoor

Broadmoor Criminal Lunatic Asylum was transferred on April 1 to the responsibility of the Minister of Health from that of the Home Secretary, under whose charge it has been since it was opened in 1863. The asylum is now managed by a Board of Control, and its address is: Broadmoor Institution, Crowthorne, Berks. The institution is part of the mental health services incorporated in the National Health Service. While the Board of Control is responsible for running the institution, decisions on the admission and discharge of patients will continue to rest with the Home Secretary. There are at present 869 patients—682 men and 187 women.

Care of Cripples

The Central Council for the Care of Cripples has issued a useful pamphlet showing how, by close co-operation between the voluntary organizations and the various statutory bodies, the physically handicapped can receive full benefit from the provisions made for their well-being. In the first part detailed instructions are given on how to start and run local associations efficiently, and the second part contains excellent explanatory notes on the relevant Acts. It concludes with a list of voluntary organizations and their addresses. Copies may be obtained for 2s. from the Central Council at 34, Eccleston Square, London, S.W.1.

David Anderson-Berry Prize

A David Anderson-Berry silver-gilt medal, together with a sum of money amounting to about £100, will be awarded in 1950 by the Royal Society of Edinburgh to the person who in the opinion of the council has recently produced the best work on the therapeutical effect of *x* rays on human diseases. Applications for this prize are invited. They may be based on both published and unpublished work and should be accompanied by copies of relevant papers. Applications must be in the hands of the general secretary, Royal Society of Edinburgh, 22, George Street, Edinburgh, 2, by March 31, 1950.

Pollution Control in the U.S.A.

As a result of the passing of the Water Pollution Control Act in the U.S.A. last year a nation-wide scheme has been started to improve water supply and sewage disposal as well as to eliminate pollution of streams by industrial wastes. A Water Pollution Control Advisory Board is being established under the United States Public Health Service to give technical assistance and advice. Fourteen river-basin offices are being set up in different parts of the U.S.A. to carry out the scheme, and they will encourage local understanding of the need for pollution control, since it is from communities themselves that requests for aid must originate.

Cooling of Ice-cream

The Ministry of Health announces that after May 1 ice-cream manufacturers will no longer be able to plead the special defence that they have ordered but been unable to obtain the necessary apparatus in any proceedings for failure to install suitable cooling apparatus. The Minister is satisfied that suitable cooling apparatus is now available in sufficient quantity to meet all the prospective demands of the trade. The special defence was introduced in the Ice Cream (Heat Treatment, etc.) Regulations, 1947, because at that time there was a serious shortage of cooling apparatus, and it was later extended to May 1, 1949, by subsequent regulations. After May 1 it will be necessary for the requisite cooling apparatus to be installed in all premises where ice-cream is manufactured other than from a complete cold mix.

Award for Prevention of Blindness

Dr. Lawrence T. Post, of St. Louis, U.S.A., has been awarded the Leslie Dana Gold Medal for 1948 for "outstanding achievement in the prevention of blindness and the conservation of vision." The award is given on the recommendation of the Association for Research in Ophthalmology. Dr. Post is Professor of Clinical Ophthalmology at Washington University Medical School.

Medicine in Singapore

The King Edward VII College of Medicine Alumni Association, which was reconstituted in 1947, now issues its *Proceedings* as an occasional periodical. The first number includes original articles on malaria, parasitology in Malaya, and helminthic parasites, and reports of cases on a wide variety of medical disorders. It is edited by Dr. B. R. Sreenivasan in conjunction with an editorial board which includes Professor G. A. Ransome.

Wills

Sir Edward Stewart, formerly vice-chairman of the British Red Cross Society and on the staff of St. Marylebone General Dispensary and the Royal Chest Hospital, left £55,974. Dr. Susan Sutherland Isaacs, the well-known child psychologist, left £2,849. Dr. Edmund Spencer Hemsted, of Kintbury, Berks, left £115,904.

COMING EVENTS

Postgraduate Lectures

The Royal College of Obstetricians and Gynaecologists has arranged a postgraduate course of advanced lectures for those studying the special practice of obstetrics and gynaecology, to be given at the College House, 58, Queen Anne Street, London, W., from Monday, April 25, to Friday, April 29, inclusive, at 12 noon and 5 p.m. each day. The fee for the course of ten lectures is 4 guineas (10s. 6d. for a single lecture). Admission is by ticket only, obtainable from the Secretary.

Port Health Authorities

The Association of Sea and Air Port Health Authorities of the British Isles will hold its 50th Annual Meeting at the Town Hall, Newport, Mon., on April 27–29. Papers to be read include: "Imported Fats," by Dr. Stuart I. A. Laidlaw; "Water," by Major W. W. Marsden; "The Control of Water and Food Supplies on Air Routes," by Sir Harold Whittingham; "Some Experiences of an Army Hygiene Officer, 1939–45," by Dr. L. H. Murray; "Port Health and its Relation to Allied Services," by Dr. T. L. J. Coxon. Particulars may be obtained from the honorary secretary of the association, Dr. H. C. Maurice Williams, Health Department, Civic Centre, Southampton.

American Congress on Obstetrics and Gynaecology

The International and 4th American Congress on Obstetrics and Gynaecology will be held on May 14–19, 1950, at the Hotel Statler, New York City. It is sponsored by the American Committee on Maternal Welfare. General sessions will be held to discuss the following topics: (1) "Physiology of Human Reproduction"; (2) "Pathology of Human Reproduction"; (3) "Social and Economic Problems"; (4) Neoplastic Diseases of the Female Reproductive System"; (5) "Obstetric and Gynaecological Procedures." Information may be obtained from Dr. Fred L. Adaire, 24, West Ohio Street, Chicago 10, Illinois, U.S.A.

Royal Sanitary Institute Congress

The council of the Royal Sanitary Institute announces that the presidents of the sections of the Health Congress to be held at Brighton on May 23–27 will be as follows: Preventive Medicine: Professor Andrew Topping; Engineering and Architecture: Sir Lancelot Keay; Maternal and Child Health: Professor W. S. M. Craig; Veterinary Hygiene: Mr. H. T. Matthews; Food and Nutrition (in conjunction with Food Group, Society of Chemical Industry): Dr. E. B. Hughes, D.Sc.; Housing and Town Planning: Mr. J. W. R. Adams; Tropical Hygiene: Professor P. A. Buxton, F.R.S.; Hygiene in Industry: Professor T. Ferguson. The president of the conference of medical officers of health will be Professor R. H. Parry. A discussion on "The Hospital and Medical Services" in the Preventive Medicine section will be opened by Brigadier J. L. Glyn Hughes and Mr. Henry Lesser. At the Conference of Medical Officers of Health Dr. C. Metcalfe Brown will speak on "Public Health Research," and Dr. J. Stevenson Logan will introduce a discussion on "For and Against Institutional Midwifery." In the Tropical Hygiene section Dr. P. C. C. Garnham will speak on "Modern Concepts in Malaria Control," and Dr. W. Berry on "The West African Groundnut Scheme." There will be a symposium on "The Care and Preservation of Fish as Food."

Almroth Wright Lectures

A course of six Almroth Wright Lectures on "The Bacterial Cell" will be delivered in the Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School, Paddington, London, W., on Tuesdays at 5 p.m., from May 3 to June 7. The lectures are open to all members of the medical profession and to all students in medical schools without fee. Details will be published in the Diary column of the *Journal* week by week.

Teaching Biology

"New Trends in Biology Teaching" is the theme of a two-day conference which is being held on May 6 and 7 at the Borough Polytechnic, London, S.E.1. Professor S. Mangham will give an opening address on "Biology for To-morrow." He will be followed by Miss Hilda Franks on "Syllabuses." Dr. L. M. J. Kramer is giving a lecture-demonstration, "Preparing and Presenting Inexpensively a Year's Course Based on the Theme 'The Child's Microbial Heritage.'" At the final session Mr. Richard Palmer will talk on "Some Neglected Aspects of Human Biology in Schools." Tickets for the conference can be obtained from the British Social Hygiene Council, Tavistock House North, London, W.C.1, price 5s. (exclusive of meals).

SOCIETIES AND LECTURES

Tuesday

SOCIETY FOR THE STUDY OF ADDICTION.—At Medical Society of London, 11, Chandos Street, W., April 19, 4 p.m., Annual general meeting; "*Alcoholism as a Neurotic Symptom*," by Dr. R. D. Newton.

Wednesday

ROYAL MICROSCOPICAL SOCIETY.—At B.M.A. House, Tavistock Square, London, W.C., April 20, 5.30 p.m., "*The Use of Thin Sections of Entire Organs in Morbid Anatomical Studies*," by Professor J. Gough and Mr. J. E. Wentworth.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—At 28, Portland Place, London, W., April 20, 3.30 p.m., "*Occupational Eye Diseases and Injuries*" (1), Illustrated, by Mr. Joseph Minton.

Friday

CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, Cambridge, April 22, 2.30 p.m., "*Some Aspects of Epidemiology*," discussion by Dr. A. M. McFarlan.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Zoological Gardens, Regent's Park, London, N.W., April 22, 7.15 p.m. for 7.30 p.m., dinner meeting.

APPOINTMENTS

BOWER, JOHN, L.R.C.P. and S.I., L.A.H., Physician, Provincial Hospital for Nervous Diseases, Farville, St. Johns, New Brunswick, Canada.

DEWAR, R. DUNCAN, M.B., Ch.B., D.P.H., Medical Officer of Health, Metropolitan Borough of Deptford.

PETERS, L. B., M.B., B.S., Senior Assistant School Medical Officer and Assistant to Medical Officer of Health, Brighton Corporation.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Davies.—On April 1, 1949, to Dr. Celia Marjorie Davies (née Rapport), wife of Dr. D. L. Davies, 13, Engel Park, N.W.7, a son.

Giles.—On April 4, 1949, at the City General Hospital, Stoke-on-Trent, to Ruth (née Whitley), wife of Dr. Christopher Giles, a son.

Kay.—On March 28, 1949, at Westgate, to Alexandra and Dr. David Kay, a son—Nicholas.

Keat.—On April 3, 1949, to Dorothy, wife of Dr. E. C. B. Keat, a son.

Lamb.—On April 3, 1949, at P.M.R.A.F. Hospital, Halton, to Joan (née Turner), S.R.N., wife of Ernest Hope Lamb, M.B., Ch.B., Squadron-Leader, R.A.F., a sister for Ernest—Susan Jane.

DEATHS

Baker.—On March 19, 1949, William Thomas Baker, L.R.C.P., L.R.C.S.Ed.

Duncan.—On March 29, 1949, at Ruthin, Wales, Thomas Smith Duncan, M.B., Ch.B., of Nottingham.

Hall.—On April 7, 1949, at his home, 31, The Drive, Hove, Donald George Hall, M.D., F.R.C.P., J.P.

Humphreys.—On March 30, 1949, Owen Rosser Humphreys, M.R.C.S., L.R.C.P., of Cardiff.

Jones.—During January, 1949, Arthur Thomas Jones, M.R.C.S., L.R.C.P., J.P., of Cardiff.

McKie.—On April 6, 1949, at Eastbourne, Gordon McKenzie McKie, M.R.C.S., L.R.C.P., aged 76.

Milestone.—On April 4, 1949, peacefully, at Redroof Nursing Home, Croydon, Evelyn Stone Milestone, M.D., of Cuckfield, Sussex, aged 85.

Visick.—On April 4, 1949, at the County Hospital, York, Arthur Hedley Visick, F.R.C.S., of The Old House, York.

Willans.—On April 6, 1949, at Foxholes, Barrs Wood Road, New Milton, Hants, Charles Rudolph Willans, M.B., Ch.B.

Wilson.—Recently, Lionel Hugh Wilson, L.R.C.P., L.R.C.S.Ed., of Sheffield.

Winter.—On March 31, 1949, at Musgrove Park Hospital, Taunton, Herbert Gregory Winter, C.B.E., M.C., M.R.C.S., L.R.C.P., Brigadier, late R.A.M.C.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Early Ambulation after Confinement

Q.—*What are the latest views on early rising after confinements? There appears to be a volume of evidence to-day in favour of getting patients up soon after operation; how does this affect ambulation after confinement?*

A.—Although letting a patient get up soon after labour is often advised and has been shown to be free from risk, it is not so popular and is not practised so widely as early ambulation after operations. The same arguments can be applied in its favour, but other considerations also arise. Very often, and especially if the patient has other young children, the pregnancy imposes a prolonged physical and mental strain, and a short period of complete rest in bed is both welcome and advantageous. Early rising, too, provides a great temptation for the woman to resume her domestic responsibilities too soon. Even in hospital practice it tends to make women clamour to return home early in the puerperium. There is also the question of the establishment of lactation, which is favoured by rest. There are, of course, counter-arguments; for instance, a woman can often breast-feed more easily sitting comfortably on a chair than propped up in bed. Indeed, it becomes almost a matter of personal opinion; yet so far many obstetricians, guided probably by general considerations such as the above, seem not to favour getting about too soon, and this is true even of those who encourage it in their gynaecological wards. Some, however, have adopted a compromise, allowing their obstetrical patients up on the fifth or sixth day. There is something to be said for selecting the treatment to suit individual patients and their circumstances rather than following a rigid routine. In the case of caesarean section, when the purely medical advantages outweigh any social disadvantages, getting the patient up on the first or second day is already widely practised—often by those who insist on the traditional stay in bed after normal labour.

Vitamin E in Heart Disease

Q.—*Is there anything further to report on the claims that excellent results have been obtained in cardiac cases by the use of α-tocopherol—a vitamin-E preparation?*

A.—Vitamin E is found in all body tissues, and has a variety of actions. Consequently it was tried as a therapeutic agent in many different conditions, with, as a rule, disappointing results. Vogelsang, Shute, and Shute (*Med. Rec., N.Y.*, 1948, **161**, 83) reported strikingly beneficial effects in about 1,500 cases of every type of heart disease. They claimed that it was the "most effective known drug in heart disease, and certainly the safest. The percentage of cases which show improvement following its administration is high (about 80%); the degree of improvement seen in the worst cases is often marked, and allows a return to activity in many cases of great disability; the improvement continues for months, even years." Since then vitamin E has been used by a number of observers in this and other countries, but on the whole the results have been most disappointing. Makinson *et al.* (*Lancet*, 1948, **1**, 102) compared results in 22 cases of angina pectoris, using vitamin E, phenobarbitone, aminophylline, and calcium lactate, and found the vitamin to be of no therapeutic value. They used a dosage of 150 mg. daily for three weeks. Ball, in a series of 10 cases of angina pectoris, using 300 mg. of "ephynal" daily for six weeks or longer, found that his results did not support the Canadian workers' claims. Levy and Boas (*Ann. intern. Med.*, 1948, **28**, 1117), in 13 cases of angina pectoris and of heart failure secondary to various causes, and also Baer, Heine, and Gelford (*Amer. J. med. Sci.*, 1948, **215**, 542), in 22 cases of heart disease, including patients with heart failure and angina pectoris, found the results very disappointing. Both teams of workers used adequate dosage according to the standards of Shute and his colleagues. Similar findings have been reported from Denmark (*Nord. Med.*, 1948, **37**, 82). Shute (*Lancet*,

1948, **1**, 301) considered that Makinson *et al.* had used insufficient dosage for too short a time, and had not given enough data about their cases. He is supported in his claims by Hickman (ibid., 1948, **1**, 652), who pointed out that the results may be due to a local preponderance of cases with an inadequate vitamin-E intake resulting from faulty dietary habits. Shute, however, constantly stresses that he uses the drug not as a vitamin but in relatively massive doses as a therapeutic agent. He refers to the remarkable results obtained in dogs and cattle with cardiovascular disease (Lambert, *Vet. Rec.*, 1947, **59**, 355), and also to the work of Govier on the biochemical background of the clinical results. Results comparable to those of Shute have not been obtained by other workers following the administration of vitamin E to patients suffering from cardiovascular disease.

Exposure to Graphite Dust

Q.—*Does graphite dust constitute a danger to health? If so, are there any precautions which can be taken to safeguard the health of those exposed to it?*

A.—Mineral graphite, or plumbago, is a naturally occurring form of crystalline carbon, appearing as black soft masses or, less commonly, as crystals in igneous rocks. It is mined extensively in Ceylon, Madagascar, and West Africa, and there is also a deposit in Borrowdale, Cumberland. Graphite is used in the manufacture of electric batteries, lead pencils, grate polishes, lubricants, crucibles, and in foundries. In these manufacturing processes it is necessary for the graphite to be in the form of a fine powder, while "commercial graphite" may have added sand. The carbon content of natural graphite varies. Thus certain grades of Ceylon graphite are stated to contain between 60 and 85% carbon, while Korean graphite has a carbon content of approximately 85%. The remainder is composed of mineral ash, such as oxide of calcium, iron, or silica. Although the presence of silica in the ash has been recognized, there is little definite information about the silica content of natural graphite, but it may be as much as 5%. There is also a so-called artificial graphite with a very low silica content obtained from coal or coke by treating in electric furnaces. On the silica content will depend the risk to health of long periods of exposure to graphite dust. Precautionary measures are those for the suppression and control of the dust hazard at its source. To this end full use should be made of wet methods of working and localized mechanical exhaust ventilation.

Pelvic Allergy

Q.—*Is there such a thing as "pelvic allergy"? If so, what are its effects, how can it be identified, and how treated?*

A.—Some relationship between the female genital organs and allergic states has long been suggested as a result of clinical observations. For instance, asthma may first appear at puberty or the menopause, the attacks may be associated with menstruation, and may disappear completely during pregnancy. The type of relationship is not constant, however, and may assume the opposite form. Again, symptoms referable to the pelvic organs may be manifestations of allergy—some states of pruritus vulvae and cyclical ulceration of the vagina and vulva, for example. B. Zondek and Y. M. Bromberg (*J. Obstet. Gynaec. Brit. Emp.*, 1947, **54**, 1) claim to have shown that many conditions, such as menstrual tension state, migraine, angioneurotic oedema, urticaria, and cyclical keratitis, which tend to occur premenstrually are due to "endocrine allergy." They postulate that the patient is allergic to one of the hormones of her own production, and they advise desensitization by the administration of graduated amounts of the appropriate hormone, the latter having been identified by skin tests. More recently C. Macpherson (*Canad. med. Ass. J.*, 1949, **60**, 54) in an article entitled "Pelvic Allergy" puts forward the view—which, as he points out, is not original—that spasmodic dysmenorrhoea in young girls can be an allergic manifestation, and he claims good results from treatment with adrenaline and antihistamine drugs. It could be argued that an endocrine antigen is unlikely in such cases because the hormone levels are at their lowest during menstruation. However, bearing in mind the fact that the basis of spasmodic dysmenorrhoea may be muscle ischaemia, it recalls the work of O. W. and G. V. Smith (*Amer. J. Obstet. Gynec.*, 1947, **54**, 212) on menstrual toxin, a euglobulin which has vasoconstrictive properties and which is liberated during menstruation. Some or all of these possibilities might well come under the unsatisfactory heading of "pelvic allergy."

There are clearly at least two problems involved: (*a*) general allergic reactions due to genital and endocrine functions; and (*b*) genital reactions as manifestations of allergic states. The whole question remains very much a matter of conjecture, and most of the suggestions mentioned above await confirmation and proof.

Contact Lenses for Myopia and Astigmatism

Q.—*Can contact lenses be prescribed for a combination of myopia and astigmatism? How are they obtained, how long does it take to get them, and what is the approximate cost?*

A.—Contact glasses can be prescribed for a combination of either myopia or hypermetropia with astigmatism. By presenting a spherical surface to the air the astigmatism is eliminated. To obtain the glasses a consultation should be arranged with an ophthalmic surgeon, who will determine whether the patient is suitable psychologically and the eyes are suitable physically for the lenses. On the basis of his examination of the eyes he will give directions to the technician, who will proceed with the making of the lenses. The time taken varies with the type of lenses ordered and the material of which they are made, and ranges from three weeks to three months. The cost is from 30 to 50 guineas, plus the surgeon's fees.

Essential Amino-acids

Q.—*I believe that milk contains all the ten essential amino-acids. Do eggs likewise contain all ten—and are there any other non-meat products that contain them all? Can you recommend an up-to-date book on the subject?*

A.—The proteins of practically all foodstuffs contain all the essential amino-acids. Gelatin is an exception. Flour contains relatively little lysine. Eggs have a high content of these amino-acids. In peas and beans the ratio of essential to non-essential amino-acids is rather lower than in meat.

Two useful books are: *Science and Nutrition*, by A. L. Bacharach (3rd ed., 1947, Watts and Co., London), and *Human Nutrition*, by V. H. Mottram (1948, Arnold, London).

Sympathectomy for Asthma

Q.—*Would you please let me know what operations upon the sympathetic and parasympathetic systems have been performed for the relief of asthma, and any references in literature to the subject?*

A.—The following operations have been performed upon the sympathetic and parasympathetic systems for the treatment of asthma: unilateral cervical sympathectomy (sympathetic chain and part of the stellate ganglion); stellate ganglionectomy, unilateral and bilateral; right-sided vagotomy below the recurrent laryngeal nerve; bilateral resection of the pulmonary plexus; procaine block of the stellate ganglion and upper thoracic ganglia, followed by their extirpation in cases where the asthma had responded temporarily to the block. The subject is dealt with adequately in a special chapter of 20 pages in *The Treatment of Bronchial Asthma*, by V. J. Derbes and H. T. Englehardt (Lippincott, London, 1946), which contains twenty-three references. Further references are: Gay, L. N., *Diagnosis and Treatment of Bronchial Asthma* (Baltimore, 1946); Malherbe, A., *Pr. méd.*, 1939, **47**, 241; Tapella, P. A., *Prensa méd. argent.*, 1940, **27**, 1553.

Sulphonamides in Pneumococcal Pneumonia and Ulcerative Colitis

Q.—(*a*) *What is the best sulphonamide for routine use in pneumococcal pneumonia, and in what dosage?* (*b*) *What sulphonamide is advised in the treatment of ulcerative colitis? Should this be given by mouth or in the form of an enema, and what is the dosage?*

A.—(*a*) Sulphadimethylpyrimidine (sulphamezathine), or one of the other sulphadiazine homologues, is the most suitable of the sulphonamide drugs for the treatment of pneumococcal pneumonia. In adults the oral dosage is as follows:

initially 1.5 g., followed by 1.5 g. four-hourly for two to three days; 1 g. four-hourly for the next two days; 1 g. six-hourly for a final two days.

(*b*) Sulphaguanidine, succinylsulphathiazole, and phthalylsulphathiazole are of value in ulcerative colitis. The third-named drug is probably the most satisfactory, and has been recommended in oral doses as large as 0.02 g. per kilo of body weight four-hourly for four weeks. Retention enemata of one of these drugs are often useful, 7 to 10 g. being dispensed in 200 ml. of water or mucilage.

Civatte's Poikilodermia

Q.—*What is the aetiology of Civatte's disease, and is there any effective treatment? I have a patient who has had patches of brownish discoloration on both cheeks, with scaling and cracking of the skin of the face, for the past two years, associated with irregular menses. A dermatologist diagnosed Civatte's disease and prescribed various lotions, ointments, and later x-ray treatment combined with stilboestrol, but the skin is steadily getting worse.*

A.—The aetiology of poikilodermia of Civatte is unknown. It usually affects women about the menopausal period and tends to clear spontaneously in the course of a few years. It has been thought to be dependent on some disturbance of endocrine function, adrenal or ovarian, and there does appear to be some response to oestrogen therapy in a few cases. As a rule treatment is without effect. A very similar affection, described by Riehl in 1917 and not limited to women or to this age period, is regarded as being related to the ingestion of fats or the application of creams containing tar and petroleum products.

Ganglion

Q.—*I have a ganglion involving the common extensor sheath on the back of the right wrist of about six months' duration. It causes little inconvenience, but is unsightly in a doctor in practice. What is the correct treatment? Would incision, evacuation of contents, and removal of a portion of the posterior wall be likely to lead to permanent disappearance?*

A.—To be strictly orthodox complete excision of the entire ganglion should be advised. But when, as in this case, it is the cause of no significant disability and little inconvenience it is tempting either to leave it alone or to attempt subcutaneous rupture of the cyst wall by very firm pressure. If operation is undertaken it should take the form of complete excision, carried out with the aid of a tourniquet under general anaesthesia. This gives the greatest prospect of permanent cure. Simple evacuation with removal of part of the cyst wall, while entailing almost as much inconvenience as complete excision, is far less likely to give permanent relief.

Stilboestrol and Seminoma Testis

Q.—*A patient aged 35 was recently operated on for seminoma of the testicle. There is no evidence at present of metastases, but the possibility cannot be ruled out. Is stilboestrol, or any similar preparation, likely to be effective, as in carcinoma of the prostate? If so, what preparation and what dosage would you recommend?*

A.—There is no evidence at present that stilboestrol or any other preparation is of value in cases of seminoma of the testicle. After orchidectomy for seminoma it is advisable to give a course of high-voltage *x* rays to the aortic lymph nodes.

Reaction to Dental Analgesia

Q.—*A patient had pounding of the heart, gastric distension, and fairly severe pain in the jaw shortly after a tooth extraction. These symptoms, along with polyuria and frequency, continued until the following morning, when he obtained relief by vomiting. This appeared to be a case of acute acidosis due to the local analgesia. Is there any way of counteracting these symptoms?*

A.—Reactions following injection analgesia are usually due to the adrenaline and not to the procaine or other synthetic local analgesic employed. Pounding of the heart sometimes occurs after the injection, particularly if any of the solution containing adrenaline is inadvertently injected direct into a blood vessel. In a patient with cardiac disease the signs and symptoms may of course be more severe. Acidosis is not generally produced by local analgesia, but patients not infrequently confuse local analgesia with general anaesthesia and fast for a period beforehand. This fasting may account for acidosis. There is of course no reason why the patient should not have perfectly normal meals before any extraction involving local analgesia.

Induction of Labour

Q.—*What is the best method of induction of labour for use by a general practitioner working in ordinary domiciliary practice? What is the foetal mortality, if any?*

A.—It is not stated whether it is desired to induce labour at term or prematurely. In ordinary domiciliary practice the general practitioner would probably be wise to transfer to hospital patients in whom the induction of premature labour seems indicated. When pregnancy appears to be at or after term, the minimum risk to mother and foetus attaches to the induction of labour when the head is engaged, the cervix is effaced, and dilatation has begun. But when these conditions are fulfilled induction is rarely required. The safest method is a "simple induction" with castor oil, enema, and hot bath. Pituitary preparations should be used with caution and are best avoided, while quinine has fallen into disfavour because of reports of foetal death following its use. Surgical methods of induction are not generally suitable for domiciliary practice, although loosening the attachment of the membranes by a sweep of the finger inserted through the cervix is reasonably safe provided the conditions enumerated above are satisfied. The risks of induction of labour to the foetus cannot be stated in general terms; they depend to a large extent on the indication for the operation and the time at which it is done, as well as on the method employed and the state of the lower segment and cervix.

NOTES AND COMMENTS

Getting Warm in Bed.—Mr. R. D. MOTHERSOLE (Bolton) writes: It is often difficult, especially for elderly people, to get warm in bed after getting up during the night. I suppose it is a matter of common knowledge (despite the trend of modern education) that warm-blooded animals get most of the heat they need from their voluntary muscles, which act as slow-combustion stoves and immersion heaters. The fuel, I need hardly say, is glucose. But I find it is less well known even by doctors, that by tensing one set of muscles against their opponents (e.g., flexors *v.* extensors) especially those of the lower limbs, but the more the better, it is possible to warm up the whole body quickly, with practically no movement of the parts concerned nor disturbance of the bedclothes.

Mind and Skin.—Dr. I. B. SNEDDON writes: My article on "The Mind and the Skin" (March 19, p. 472) was an abridged version of the paper which was given to the Sheffield Medico-Chirurgical Society on Oct. 18, 1948. I should be grateful if this correction could be made.

Ankylosing Spondylitis.—Dr. F. HERNAMAN-JOHNSON writes: I regret that the dosage of gold and sodium bismuth tartrate is not made clear in my letter in your issue of April 2 (p. 591). It is 0.001 g. of gold (as printed) and 0.5 *grain* (not 0.5 g.) of sodium bismuth tartrate.

Correction.—Dr. T. STEPHANIDES writes: With reference to the article "Ringworm of the Scalp: Treatment by *X*-ray Epilation without Subsequent Local Application" (March 26, p. 523), I would like to point out a typist's error which crept into the text. The statement "Open field 16.6 in. (42 cm.) diameter" should, of course, have read "Open field 16.6 *cm.* diameter." It will be noted that all the other measurements were given in the metric system only.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.